Volume 5, Number 5 $3.50 February/March 1988

TEACHING and computers

THE B·A·S·I·C

BARBARA MORGAN

EXCLUSIVE INTERVIEW WITH THE NEXT TEACHER IN SPACE

Snake Sense Data Base

Teacher's Test-Makers

SCHOLASTIC

Looking for ways to put your computer to work helping you teach science? social studies? writing?

Here's all you need...from *Teaching and Computers*!

Here, at last, are the classroom computer products that so many teachers have been asking for.

Products that will help you teach social studies, science, language arts, math–and not just computer skills.

Products packed with lessons that students can do on their own; others that you can complete in 15 or 20 minutes; still others that knit seamlessly into your existing curriculum plans to help you use the computer more effectively.

The costs are low, the variety is tremendous, and the excitement of teaching with the help of a computer is all yours. From the pages of the #1 classroom computer magazine for K-8: *Teaching and Computers.*

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Grades K-8

8 colorful computer-awareness wall posters (16 × 22), each with reproducible worksheets that reinforce concepts taught on the posters: computer history, parts of the computer, the keyboard, BASIC programming, Logo, and more. Teaching Guide includes worksheet answers and suggestions for additional activities. Reprinted from *Teaching and Computers* magazine.

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Micro Puzzles

Grades 3-8

Forty pencil-and-paper puzzles for independent student work. Perforated blackline masters photocopy well and help teach programming basics, computer history, computing vocabulary, computer applications, and robotics. Published previously in *Teaching and Computers* magazine.

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Grades 3-8

10 brief science lessons from Teaching and Computers magazine (energy, nutrition, plants, animals, space, the human body), each with a complete plan (including reproducible worksheets) and each with an easy-to-use BASIC program already on a disk for you. Includes how to make your own science quizzes on any topic.

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Social Studies Lesson Plans

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10 social studies lessons from *Teaching and Computers* magazine (world geography, Black history, the stock market, election campaigns), each with a complete plan including reproducible worksheets and each with a ready-to-use program on a disk to save you time. Includes how to make your own social studies quizzes.

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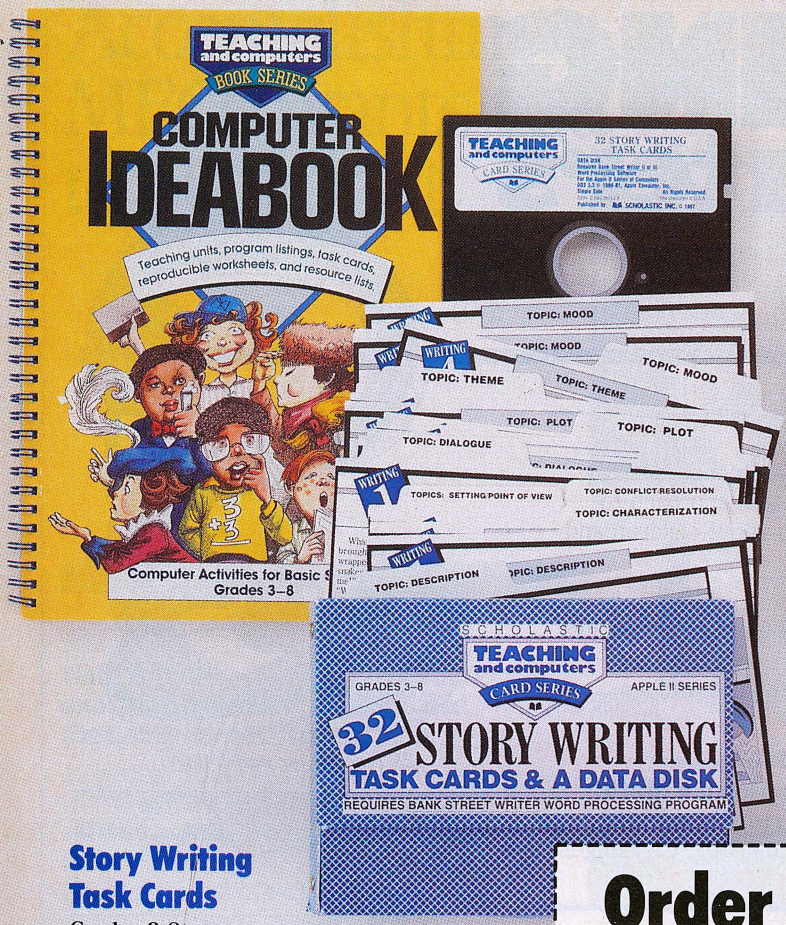

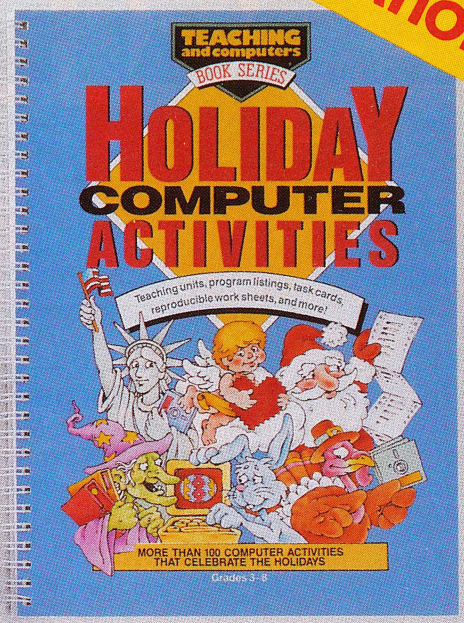

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More than 30 self-contained lesson plans any classroom teacher an use with any major machine to integrate the computer into such curriculum areas as reading, language arts, social studies, math, science, music, and art. Many lessons include reproducible worksheets, task cards, recommended software, and program listings.

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XY39310 **Story Writing Task Cards**		19.95	
XY39046 **The Computer Ideabook**		17.95	
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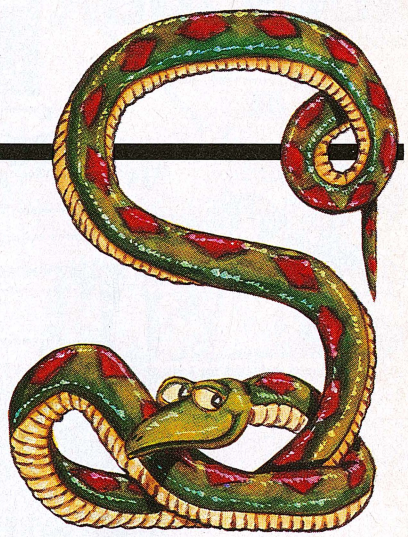

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They're not cold and slimy, and they don't all bite: these are just two of the facts your students will learn about snakes in the course of this science data base project that s-s-s-stretches critical thinking skills, too!

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A series of Logo task cards focusing on problem solving skills. This issue, the cards teach deductive and inductive logic.

PLUS

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"Building Blocks." Open your students' eyes to the architecture all around them with this collection of fascinating facts and hands-on activities — all with a high-tech twist!

***T&C's* Poster Worksheets**
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COVER PHOTO BY EARL BROCKMAN

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UPDATE

NEWS FOR COMPUTER-USING TEACHERS

WHAT DO YOU DO WITH ONE COMPUTER? LESSON PLAN CONTEST FOR EDUCATORS

As any teacher with limited computer access knows, having just one computer in class can be more of a hindrance than a help — unless you hit upon the right classroom projects to work with. That is the idea behind "What Do You Do With One Machine?", a contest sponsored by Technology in Education (TIE), a Colorado-based technology organization for educators.

Participants not only have the opportunity to win the grand prize, a Telex Magna-Byte LCD Display (which allows you to project computer images with an overhead projector), or other prizes, including software or a one-year subscription to *Teaching and Computers*. All worthy submissions will also be considered for inclusion in an "anthology of ideas," to be distributed at a TIE conference for educators scheduled for June 29 to July 1, 1988 in Aspen, Colorado.

Contest entries will be judged on originality, clarity, management strategies, and the connection to curriculum. Each entry should include the following information: a title for the lesson plan; source information for hardware, software and other equipment used; grade level; content area; purpose of the lesson; total time needed to complete; estimated in-class time on the computer; a lesson overview; and extension activities. Participants should also include their name, school affiliation, school phone number, home address, and home phone number.

Entries should be postmarked no later than April 15, 1988, and sent to Bernajean Porter, c/o TIE, P.O. Box 14028, Boulder, CO 80308; 303/665-4408.

INDIVIDUAL TEACHER'S GUIDES FROM BRODERBUND

Teacher's guides that until now have only been available with the purchase of a lab pack or school edition of certain Broderbund software products are now available on an individual basis. The guides, which contain reproducible worksheets, lesson plans, and extension activities, are available for *Dazzle Draw, Fantavision, Science Toolkit Master Module, ShowOff, the Print Shop, Type!, Where in the USA is Carmen Sandiego?* and *Where in the World is Carmen Sandiego?*

The suggested retail price for each guide is $10. The guides may be ordered from any Broderbund authorized education dealer, or from Broderbund Software-Direct, P.O. Box 12947, San Rafael, CA 94913-2947; 415/492-3500.

(Circle 104 on Product Info Card.)

FREE TEACHING TIPS FROM SUNBURST

Sunburst Communications has announced the availability of *More Ideas*, a catalog filled with teaching tips and suggestions for integrating computers and software into the curriculum. The publication also contains an interview with Thomas C. Bretl, author of many Sunburst programs, and a report on educational developments at the Howard Elementary "School of Today" in Eugene, Oregon.

For your free copy of *More Ideas*, call Sunburst toll-free 800/431-1934 in the U.S. or 800/247-6756 in Canada, or call collect 914/769-5030.

(Circle 109 on Product Info Card.)

DISCOVER "DESIGNASAURUS" SOFTWARE CONTEST

To introduce a new three-in-one educational software program called *Designasaurus*, DesignWare, Inc. (a Britannica Software company) is sponsoring a contest. No purchase is necessary, and entering is as simple as filling out an entry form and identifying the three main activities in the *Designasaurus* program.

The program, available for IBM, Tandy, and Apple II series computers (and compatibles) teaches "dinophiles" of all ages in three different ways: through a simulation called "Walk-A-Dinosaur"; a dinosaur construction segment called "Build-A-Dinosaur"; and through factual posters about twelve different dinosaurs, in a third segment called "Print-A-Dinosaur." The program retails for $39.95.

The contest's grand prize winner will receive an all-expense-paid trip for four to "Kingdom of the Dinosaurs," an adventure ride at Knott's Berry Farm in Anaheim, California. Twenty $100 gift certificates redeemable for any Britannica Software products will be awarded to runners-up.

To enter, fill out the entry form available from software dealers carrying the product or directly from Britannica Software, 345 Fourth St., San Francisco CA 94107; 415/546-1866. Entries must be postmarked no later than March 31, 1988.

"LOGOWRITER" OFFERED UNDER HOME-USE PURCHASE OPTION

Logo Computer Systems Inc. (LCSI), publishers of *LogoWriter* — the software program that combines Logo programming and graphics capabilities with word processing — is now offering a home-use purchase option to any school with a *LogoWriter* site license. Under the home-use agreement, for a one-time fee of $150, schools can make unlimited copies of the *LogoWriter* disk to loan to students for use at home.

For more information, write Logo Computer Systems Inc., 121 Mount Vernon St., Boston MA 02108; 800/321-LOGO.

(Circle 105 on Product Info Card.)

EDUCATORS' EXCHANGE ON "THE SOURCE"

Subscribers to the online information service, The Source, are invited, at no extra cost, to make use of The Educators' Exchange (EDEX), a place on the network for both teachers and students to meet and exchange ideas.

Begun in June, 1987 as a forum for educators, EDEX has since grown to include a "student center," as well. A regularly scheduled "chat" for teachers is held every Sunday night at 9:30 Eastern Standard Time. Recent topics have included "AIDS and Education," "Education in the 1990s," and

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UPDATE

"Technology and Education." Student Center "chats" are less structured and a teacher is normally available to offer help and answer questions, be it about homework, the system, or any other topic.

Online bulletin boards and a members' directory for both sections of the EDEX service are available, enabling members to contact one another individually.

For more information about EDEX, write to Cos Civale, P.O. Box 6047, Bridgeport, CT 06606. For more information about The Source, call toll-free 800/336-3366.

CHANGES IN SITE LICENSE AND LAB PACK POLICIES

Recognizing the educators' need to acquire multiple copies of software programs for classroom use, a growing number of software companies have developed price-competitive and simplified ways to make their own products more accessible. The new policies of three such companies are outlined below.

•***J. Weston Walch, Publisher*** has developed "The Whole-Class Software Solution." Educators automatically acquire the right to make as many copies of each program purchased as necessary — despite class size — at no extra cost.

For more information, or a free catalog of Walch's computer education products, write to J. Weston Walch, Publisher, P.O. Box 658, Portland, ME 04104-0658; toll-free 800/341-6094 (U.S.) or 800/221-5537 (Canada).
(Circle 106 on Product Info Card.)

•***Society For Visual Education, Inc.*** (SVE) has developed "Copy Our Disks." With this plan, educators are permitted to make five free duplicate disks of every SVE software program purchased. The only stipulation is that duplicates be used only at the site that received the original program.

For more information, call SVE toll-free 800/621-1900.
(Circle 107 on Product Info Card.)

•***WATCOM Products, Inc.*** has announced "Breakthrough," a software site-licensing agreement that promises to deliver each of WATCOM's software programs to a school board or district for a per-student cost of between five and 10 cents, or a per-computer cost of between $10 and $20 (depending on the program purchased). An additional basic annual fee of $575 provides for maintenance, technical support, one set of software documentation, and ongoing updates from WATCOM.

For more information, contact WATCOM, 415 Phillip St., Waterloo, Ontario, Canada N2L 3X2; 519/886-3700.
(Circle 108 on Product Info Card.)

TOP SCORES COMPETITION SET FOR "MATH MASTERY" SOFTWARE BUFFS

The Cerebic Institute, publishers of a software program called *Math Mastery* which emphasizes estimation skills for learners of all ages, is sponsoring a math competition for users of the program.

Math Mastery, for Apple II series computers, challenges users to tackle computations in their heads. Immediate feedback to each problem is given in the form of an audio-visual clue indicating that an answer was too high, too low, or perfect.

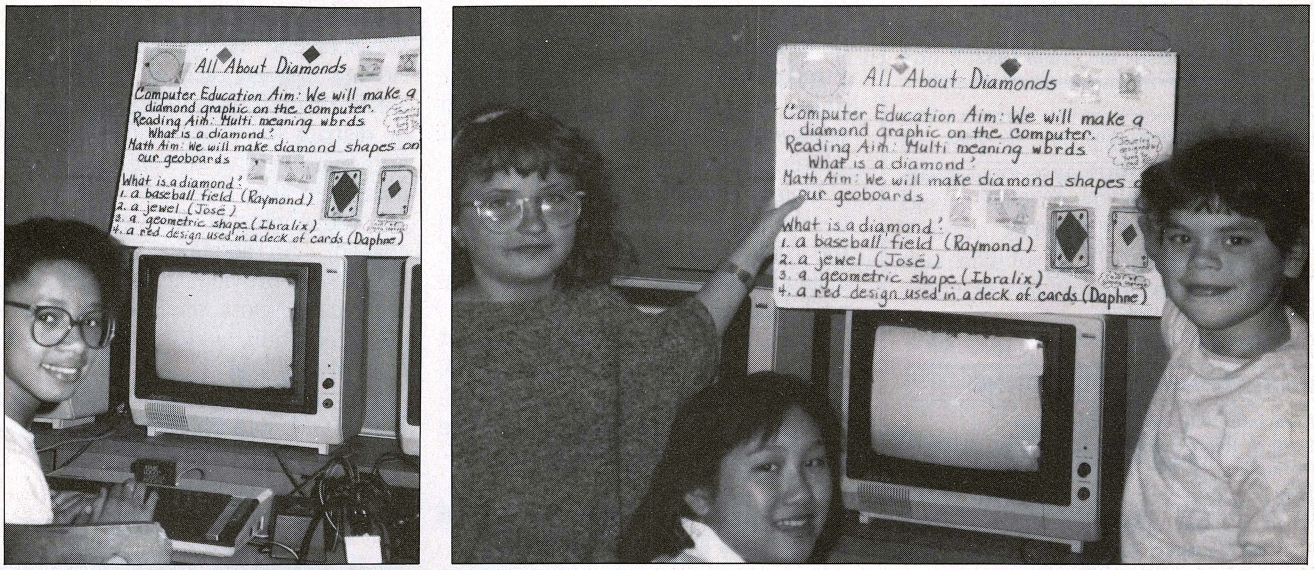
Users achieving a certain level of competency are given on-screen instructions on how to enter their best score into a by-mail competition, which will be held next fall. The names of winners will be included in a newsletter to *Math Mastery* users, also to be published sometime next school year.

Math Mastery is available in both a single player version for $49.95 and a school version for $159.95. The latter includes record keeping capabilities for up to 40 students; instructions for organizing classroom, schoolwide, or citywide math competitions among users; and permission for the purchaser to make as many copies as necessary for use in his or her classroom.

For more information, or to order *Math Mastery,* write The Cerebic Institute, P.O. Box 9, Milton, NC 27305; 804/822-7026. ■

CLASSROOM HAPPENINGS

WHAT'S HAPPENING IN COMPUTER CLASSROOMS



Under P.S. 9 Manhattan's Learning to Read Through the Arts program, figurative language is a kid's best friend. These children focus on multiple meanings of computer terms and geometric shapes.

READING, ART, AND LOGO

At Public School 9 Manhattan in New York City, children study art and reading in every class — including computer science!

As the demonstration site for New York City's Learning to Read Through the Arts (LTRTTA) program, P.S. 9 Manhattan requires all of its teachers to include in every lesson plan at least one art aim and one reading aim, in addition to their primary subject objectives.

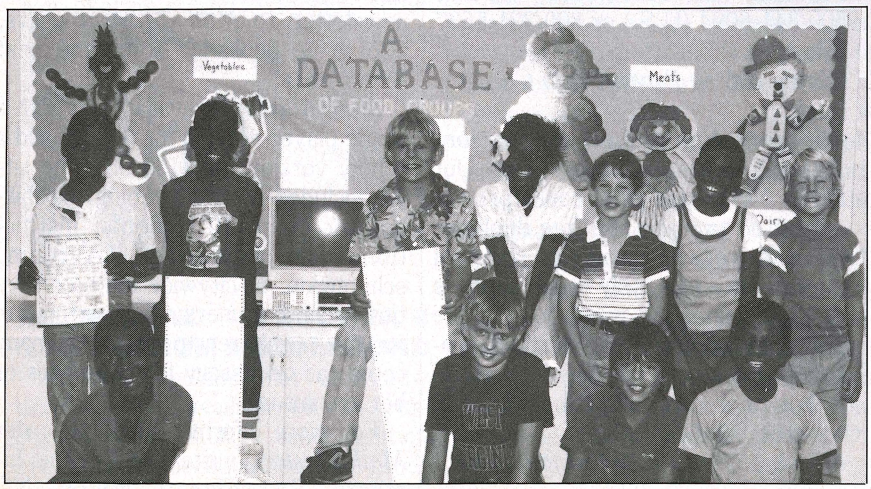
As the computer education instructor at P.S. 9 Manhattan, Marilyn Siegel is proud of her school's LTRTTA program. But how does she manage to tie computer science in with reading and art on a daily basis?

"Why, its easy!" says Marilyn. "And since we use Atari computers — which have great color capabilities — the kids can be extremely creative."

One of Marilyn's favorite approaches is to have her students work with figurative language. After studying debugging, for example, her students drew pictures of things that "bug" them. Another time, after learning how to program a diamond in Logo, the children used the word "diamond" in sentences, and illustrated these on paper (see photograph).

As inner city kids, Marilyn notes, her students don't have the same computer opportunities that many students in wealthier neighborhoods have. "These children don't usually have computers in their homes, for example. More often than not, the parents are not even acquainted with the way computers work. Even so," Marilyn adds, "these kids are really doing a great job!"

To learn more about the Learning to Read Through the Arts program, contact Bernadette O'Brien, originator and director of LTRTTA and principal of P.S. 9 Manhattan, 100 West 84 St., New York, NY 10024.



Don't they look healthy? These students are experts in balanced diets!

FOOD GLORIOUS FOOD! DATA BASE

When Patricia Shubert decided to introduce computer data bases to her second and third grade learning disabled students at the Willard Model School in Norfolk, Virginia, she first took an informal class poll.

"What's your favorite part of the school day?" she asked her students.

There was no contest: "Lunch" was the winner by acclamation. And with that, Patricia decided to focus her class's first data base on food.

Using the school lunch menu as a resource, Patricia helped the children design a data record. Each field was given the name of one of the five

basic food groups. There was also a field in which to log the date.

Every day for a month Patricia's students diligently entered each item on the school lunch menu into the appropriate food group field of that day's data record. They also put together a list of questions that they hoped the data file would help them answer, beginning with "Did the school cafeteria serve at least one item from each of the food groups every day?" (The answer, of course, was yes!)

The children had other questions as well, such as: How many times a month did the cafeteria serve pizza? Was fish always served with french fries? Was it necessary to put ketchup out on the lunch tables every single day?

"Not only did I see a marked improvement in my students' typing skills as they used the data file," says Patricia, "but their reading vocabularies skyrocketed as well. Before I knew it, the children were handling words like 'sauteed,' 'diced' and 'crisp.' They were even able to tell me which of the words are nouns, which are verbs, and which are adjectives!"

Lunch is still a favorite "subject" for the majority of Patricia's students. The difference is, now they know a whole lot more about it!

SIGN LANGUAGE ENTERS THE COMPUTER AGE

Last summer, deaf students at the Lafayette School in San Diego, California had the opportunity to try out a new type of software program — one that allows users to "write" in sign language.

Sign Post *publishes sign versions of works by deaf authors, young and old.*

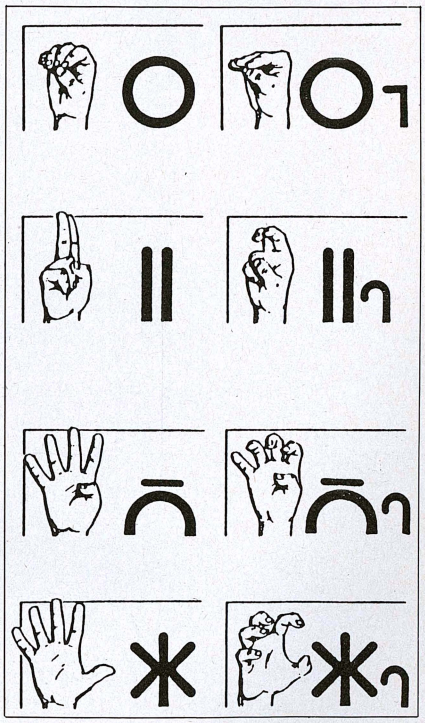
The program, called *SignFont,* is based on an alphabet for writing American Sign Language (ASL), with characters for handshapes, actions, locations, movements, and non-manual behaviors. Like English, the Signfont language reads from left to right across a page.

"Because it's difficult to teach English to a person who has never heard it before, deaf people do not always have as large an English language vocabulary as they do a vocabulary in sign," explains Don Newkirk, project coordinator of Signfont. "People who use ASL also have their own cultural community. . . SignFont gives these people a way to express themselves in writing in the language that they are most familiar with."

During the week that Don was at the Lafayette School teaching SignFont, the childrens' days were broken into two parts. In the mornings, Don worked with the children at off-computer activities, teaching the Signfont language with flashcards and worksheet activities. Then, working at computers in groups of two, the children wrote their own stories using the *SignFont* word processing program in the afternoons.

"The kids found learning to use the Signfont language like doing an exciting puzzle," says Don. "By the end of the week, they were doing a very good job of decoding the signs."

The *SignFont* computer program is designed for Apple and Macintosh computers. For more information about it, or about the free handbook called *Architect: Final Version* that teaches the Signfont written language, contact Don Newkirk, Emerson & Stern Associates, Inc., 10150 Sorrento Valley Rd., Suite 210, San Diego, CA 92121.



In Signfont, each hand motion is represented by a different symbol.

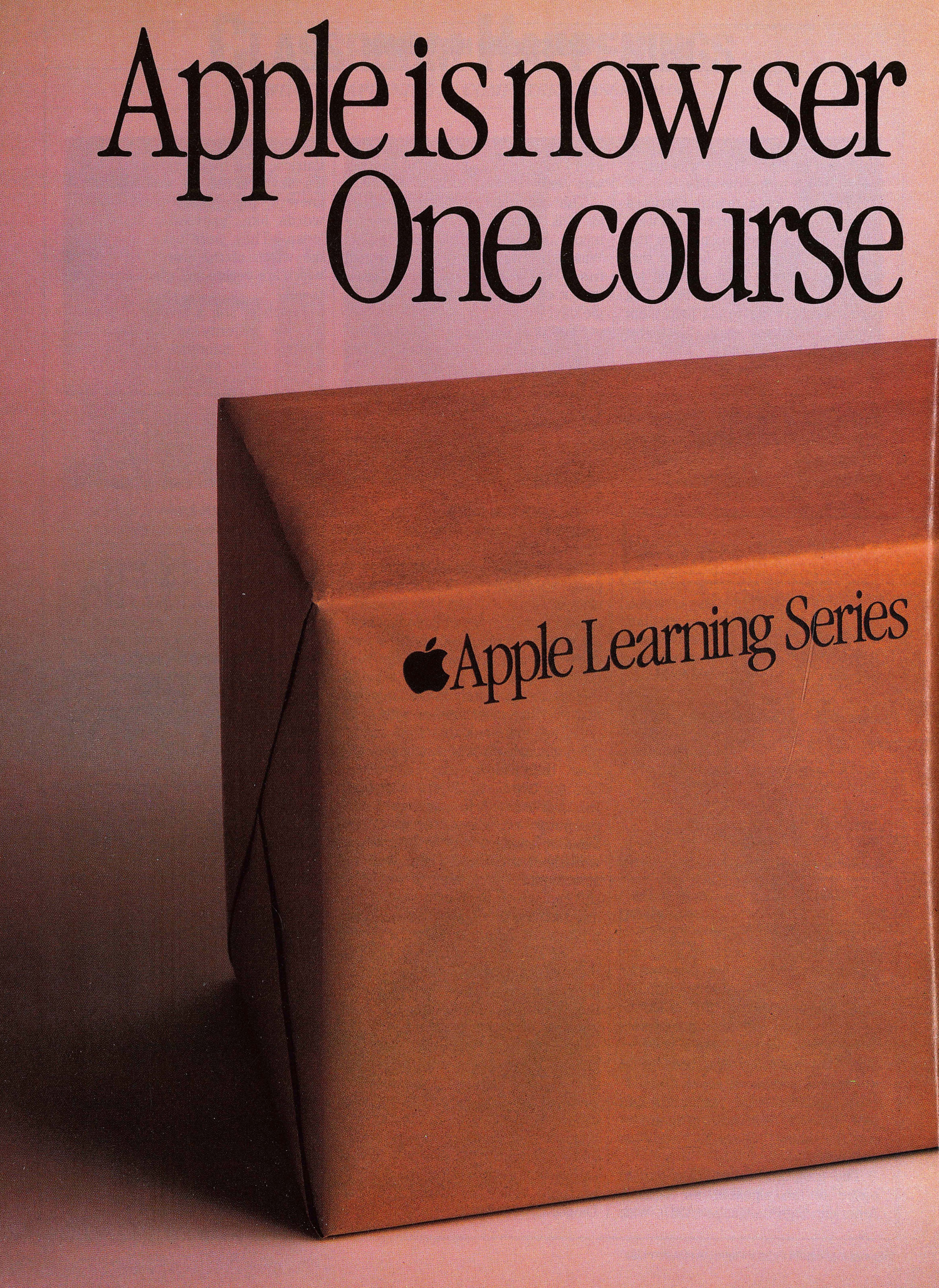
BE A REPORTER

Come on, all you early childhood educators! We know you're out there! What exciting computer project has *your* class been working on lately? We'd like to tell our readers about it in this column.

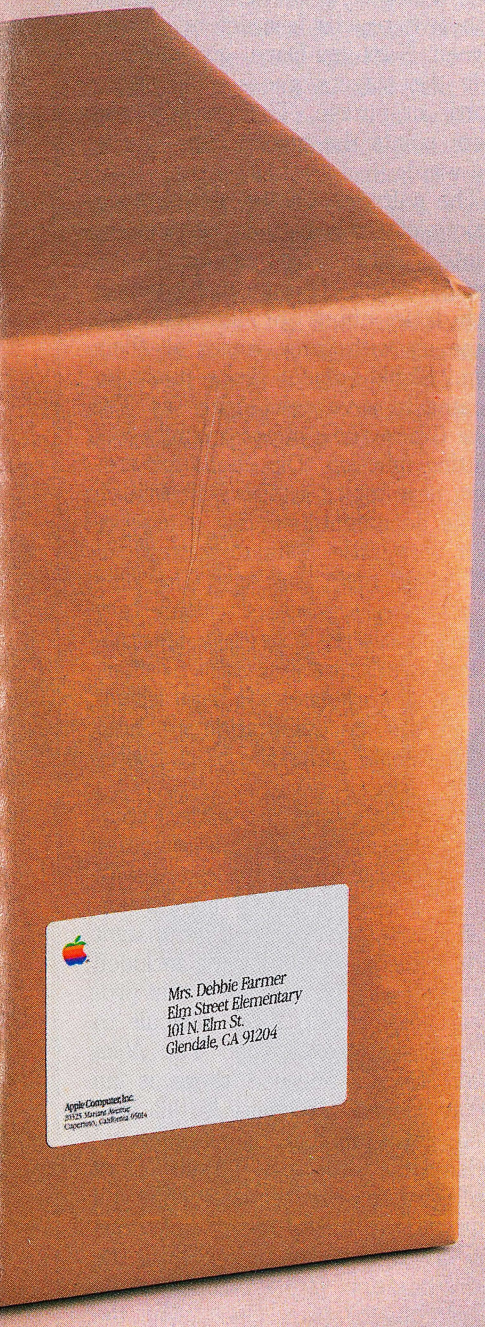
Send a brief description of your project along with any photos you can spare. We'll pay $25 to $50 if we publish your story. Write: "Classroom Happenings," *Teaching and Computers,* 730 Broadway, New York, NY 10003. ■

BY JACKIE GLASTHAL

Apple is now ser
One course



ving education. at a time.



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THE WELL-MANAGED CLASSROOM

COMPUTER SOLUTIONS FOR ADMINISTRATIVE TASKS

Tailor-Making Your Tests

BY MARY E. DREW

Test-time used to mean drudgery for teachers and pencil-and-paper tedium for students. But since microcomputers have found their home in many schools across this nation, all that has changed. Software today makes it easy for teachers to create tests tailor-made for their own classrooms. And students in any grade can now have their mastery of concepts and objectives evaluated either on the computer or on worksheets which were generated by the computer.

Test-making software comes in a variety of forms, as the following examples for Apple II series computers make clear.

A good basic test generating program is Educational Activities Inc.'s ***EA Test Writer.*** This program allows teachers to create and save multiple choice, true/false, fill in, and short answer tests. This software also gives teachers the ability to create word searches. Teacher-made tests can be administered at the computer or in printout form. The software has a built-in management system which will keep track of each student's progress. Each test can have a maximum of 30 questions, and up to 50 tests can be saved on the disk. Editing and revising any test is simple. If the teachers plan to have students take tests at the computer, they have the option of determining how many guesses the student will be allowed to answer a question correctly.

Final Exam, published by Earthware Computer Services, is a program for the teacher who has had some experience with a computer. The software allows the teacher to create tests of a maximum of 75 questions, for students to take at the computer or on paper. True/false, multiple choice, matching, and short answer questions (all of which are limited to 35 characters, with teacher options for multiple tries and alternate answers) can be automatically graded by the computer, while essay questions must be graded by hand. What puts *Final Exam* in a league by itself, though, is that it allows teachers to illustrate their tests. By using a 2-dimensional or 3-dimensional sketch pad, the teacher may create graphics to accompany any question. The teacher may also use pictures created from other software packages.

TestWriter, published by K-12 Micromedia, is an "item bank" test-making program. This means that once you have entered your questions into the computer, you can create alternate forms of a test in a matter of seconds. This program is a favorite with teachers who share the same subject and grade. With more than one person adding questions to a test bank, test-making becomes that much easier. In addition, *TestWriter* will produce printed answer keys for quick grading. Tests can be administered in hardcopy form or saved to a disk file for use with the *AppleWorks* or *Applewriter* word processor.

An item-banking program for Commodore and IBM PC computers as well as Apple IIs is ***Testmaster,*** published by Midwest Software. This program's data banks can store up to 100 questions. The documentation is written in a tutorial form so a person with limited computer knowledge will be able to use this program with ease. *Testmaster* produces hardcopy tests only; it does not allow the students to take tests at the computer.

Two item-banking test-makers exclusively for the IBM PC and compatibles are ***Test Quest*** by Snowflake Software and ***Excelsior Quiz*** by Excelsior Software. *Test Quest* uses a built-in word processor, while *Excelsior Quiz* works with your own word processing program. The Excelsior package also allows for weighting of questions to assist in test grading. Neither program places a limit on the number of questions generated.

Computer-generated tests can be be as much fun to take as they are easy to make. Students love to watch game shows on television; two pieces of test-making software which capitalize on this fact are ***Tic Tac Show*** and ***The New Game Show,*** both published by Advanced Ideas for Apple II series, Commodore, and IBM PC and compatibles.

The New Game Show is an update of Advanced Ideas' 1983 *Game Show.* The program can be used by one or two students, or students in teams. The two regular characters on the screen, Nora and Dave, give clues to help the players guess a "mystery word" or phrase. The players earn more points the quicker they guess the word.

The software comes with a wide variety of ready to use, curriculum-related games for grades three through eight. These can be edited with little effort, or teachers can come up with game topics all their own. Blank subject disks must be created to save new topics, so *The New Game Show* offers a handy formatting function. Directions for creating new topics are so well written in the documentation that a teacher with very little computer expertise will easily meet success. The only restriction is that clues and mystery words (including acceptable alternative answers) are limited to 37 characters. A worksheet has been included in the documentation to help teachers stay within the 37 character limit.

In *Tic Tac Show,* the student competes with a friend or the computer to answer questions associated with numbered squares on the screen. Wild cards which allow for instant possession of squares are included for extra excitement. With this program it is a little more difficult to create new topics than *The New Game Show.* Because there is no "wrap around" capability in this program's text function, teachers are restricted to the length of each line of the question. Directions to help you improve the looks of any questions you create are clearly written in the documentation, so this should not be a problem for long. Once again the ability to format blank disks to save new topics is built into the software. Teachers can decide if they want

their questions in sequential or random order. They may also decide if they want wild cards and if so how many.

As you can see from these examples, there is a wide range of test software available on the market today. Decide what your needs are before you purchase a program. Are you most interested in programs which create test question banks which you can use year after year and edit with ease, or do you want a program which will provide entertainment along with an evaluation of your students' progress? Do you want tests which are eye-catching and individualized, or will you be content with standard multiple choice tests? Most likely you can find exactly what you want in a form which will match your own computer expertise. You'll soon be making tests with ease — and making them *your* way.

Mary E. Drew is Assistant Principal at the Summit Hill Junior High School in Frankfort, Illinois.

TEST-MAKERS

EA Test Writer for Apple II series, 48K, requires Epson printer. $69. Educational Activities, 1937 Grand Ave., Baldwin, NY 11510; 516/223-4666.

Excelsior Quiz for IBM PC and compatibles. $145. Excelsior Software, P.O. Box 2760, Bryan, TX 77805; 409/774-4729.

Final Exam for Apple II series; graphics require Imagewriter I or II printer with super serial card, or Epson MX, LX, or FX printer with Apple parallel card and Graphtrax. $29.95. Earthware Computer Services, P.O. Box 30039, Eugene, OR 97403; 503/344-3383.

Testmaster for Apple II series, Commodore 64, and IBM PC and compatibles. $35. Midwest Software, Box 214, Farmington, MI 48024; 313/477-0897.

Test Quest for IBM PC and compatibles. $99, includes free building license and two manuals. Snowflake Software, 8 Cedar Heights Rd., Rhinebeck, NY 12572.

TestWriter for Apple II series. $29.95. K-12 Micromedia, 6 Arrow Road, Ramsey, NJ 07446; 800/922-0401.

Tic Tac Show and ***The New Game Show,*** Apple II, Commodore, IBM PC and compatibles. $39.95 each. (Original *Game Show* upgrade, $15.) Advanced Ideas Inc., 2902 San Pablo Ave., Berkeley, CA 94702; 415/526-9100. ■

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The Memory Machine

Elephants and computers never forget. Children, on the other hand, do — and often become impatient with themselves as a result. A misplaced toy can lead to a morning of pouting; a joke with a forgotten punchline can lead to tears.

Your students may be relieved to learn that human beings *can't* remember everything in their heads — and that's one of the reasons computers were invented! The computer, as your students will learn this month, offers many ways to store information. In the activities below, students will use a calendar and a data base program to store information about the weather, themselves, and some of the special days that occur in February and March.

PROGRAMS TO CHOOSE FROM

One kind of "memory tool" that children will learn about is the computerized calendar. *The Electric Crayon* (Educational Publishing Co.), *Create A Calendar* (Epyx), *Print Shop Companion* (Broderbund) and *Principal's Assistant* (Mindscape) all have good, easy-to-use calendar-creating options, with plenty of fun graphics to choose from.

The other computer memory tool explored this month is the data base management program. Several data base packages are written at a level that even young children can understand and manipulate. The *Bank Street Beginner's Filer* (Sunburst), for example, is designed to introduce young students to fundamental data base concepts. *Secret Filer* (Scholastic) presents ready-made index cards on the monitor, offering students a visual model of how a data base works.

Check your software company catalogs for the calendar-makers and data base programs that best suit your needs.

COMPUTER MEMORY HELPERS

Have children call out "tricks" that people use to remember things. (*People write things down, tie a string around their finger, or ask a friend or parent to remind them.)* Sometimes, tell children, people use computers to help them remember things, too. Computers have a much better memory than people do!

For example, if you want to remember important dates and events, you can use a special calendar program on the computer. The difference between a regular calendar and a computer calendar, tell children, is that the computer makes it easy to change, add, even decorate the information on a calendar.

Another way the computer helps you remember, tell children, is with a special kind of software called a data base. ("Data," you might explain, is another way of saying "information.") A data base is different from a calendar because it can remember information in any order that you want — and you can change the order around as often as you like.

GROUNDHOG DAY WEATHER CALENDAR

In this activity, children learn about computerized calendars, practice their counting skills, and hear all about Groundhog Day and weather prediction.

Preparation: You will need a calendar-making program, such as one of the packages mentioned above, and a printer. Use the calendar program to create two calendars, labelled "February" and "March" respectively, but without any dates marked in. Save the calendars on disk, then make printouts (or photocopies of printouts) for each child in your class. Each child will also need a pencil and crayons.

Discussion: Tell children the story of Groundhog Day. On February 2, according to the story, the groundhog wakes up from his long winter's sleep and goes outside his burrow to see what the weather is like. If the sun is shining, the groundhog sees his shadow and is frightened. He will rush back inside for six more weeks of sleep. This means that the groundhog predicts six more weeks of winter. If the day is cloudy and the groundhog does not see his shadow, he does not get scared. This is a sign that spring is on its way.

Tell the children that the legend of the groundhog is very old. Today, weathercasters have better ways of predicting the weather — including using computers! One thing that all weathercasters do, though, is keep track of what the weather is like every day. By using a calendar, your students can "play weathercaster" and check the groundhog's prediction as well.

Activity: Distribute the blank calendars, and challenge the children to use their number skills to fill in the dates for February and March. (You will need to tell the children what day

How long until spring? Children keep track with weather calendars.

Michael Donato

the first of each month falls on, and how many days there are in each.) When they are through, boot up your calendar-making program, gather your students around the computer, and show them how the computer puts each date in its proper place for February and March. Save the calendars on disk, then print them out and post them on the bulletin board for children to compare with their own.

On the square labeled February 2 on their own calendars, have children draw in (or "record") the weather for the day with clouds, sun, raindrops, snowflakes — whatever the case may be. If possible, take the children outdoors and have them look for their own shadows. Based on the groundhog legend, what do they think the weather will be for the next six weeks? Record the class prediction on a piece of paper and post it, along with any local newspaper stories about Groundhog Day, on the classroom bulletin board next to the computer-made calendars.

Each day for the next six weeks (through March 15), have children draw in the weather on their own calendars. Then gather the class around the computer again and call up the February and March calendars you saved on disk. For each date from February 2 through March 15, have students call out the weather conditions they recorded, and show them how graphics and text can be used to enter this same information into your computer calendars. Make new calendar printouts to circulate and post on the bulletin board. Discuss with your students what, in general, the weather has been like since February 2. Was their Groundhog's Day prediction correct?

A BIRTHDAYS DATA BASE FOR PRESIDENTS AND KIDS

Kids learn about data bases and create one to keep track of important birthdays.

Preparation: You will need a data base program, such as one of those recommended above, and a printer. You will also need pictures of George Washington and Abraham Lincoln.

Discussion: Have children tell you what they know about the job of being president. Can students identify the presidents from their pictures?

Explain to the class that George Washington was a great soldier who helped America become a free nation. He was also the new nation's first President. When talking about Abraham Lincoln, tell the children that as a boy he loved to read books. When he became President, he gave black slaves their freedom at the end of a long and difficult war. Both presidents, tell children, were born in February and both their birthdays are now celebrated as holidays. Find out, by a show of hands, how many of your students were also born this month.

Activity: Load a data base program into your computer. Set up a BIRTHDAYS data file, using these three field names:

NAME:
MONTH:
DAY:

Now enter the dates that Washington's and Lincoln's birthdays are celebrated (February 15, and February 12, respectively). Call your students to the computer one at a time, and help them to enter their names and dates of birth into the data file. When the file is complete, show the children how you can SORT the information many different ways, such as by month or name. You can also SELECT one child's name and look up his or her birthday by itself.

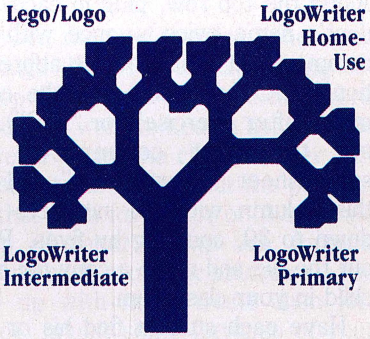
Print out the data file in chronological order by month, and hang this sheet on a classroom bulletin board. Help students use the printout to find out in which month the most classroom birthdays occur. Then help each child locate his or her own name on the printout. ■

Trisha Ainsa is director of the Computer Literacy in Children, Title VII Program, Region XIX Education Service Center, El Paso, TX, and an associate professor at the University of Texas at El Paso.

Circle 23 on Product Info Card.

The Evolution of Our Family Tree

LogoWriter started as innovative software and comprehensive learning materials designed for intermediate grades. Look how LogoWriter has grown.



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MICRO IDEAS

QUICK COMPUTER TIPS AND ACTIVITIES

A "HEART-THROBBING" IDEA

For Valentine's Day, teach your students about their *real* heart and the way it works. Help children create individual spreadsheet "Heart Charts" comparing their heart rates both at rest and after exercise. Your students can even design the charts to look like electrocardiograms! (An *electrocardiograph,* tell students, is an instrument that measures the electrical activity of a person's heart as it beats. An *electrocardiogram* — EKG or ECG — is the tracings made by the electrocardiograph machine.)

To create the chart, load a spreadsheet program into your computer. Along the top row, plug in each student's name twice — once with the comment "at rest" (or the abbreviation "A.R.") and once with the comment "after exercise" (or "A.E."). Label the first column of the spreadsheet "Heart Rate," and list this column with the numbers 150 down to 30, counting by fives. Print out the file and make a copy for each child in your classroom.

Have each student find his or her pulse, and count the number of beats in 30 seconds. Then have students multiply by two to find their own heart rates. Have each child plot that point on his or her individual "heart chart" at the point where the child's name appears "at rest." Have students repeat the process after 30 jumping jacks and make note of their heart rates after exercise.

Go around the classroom and have students call out their two heart rates in the same order as their names appear on the "heart charts," so their classmates can plot these rates on their own graphs, as well. Then have students connect the points.

Using these charts, challenge students to answer such questions as "What is the average 'at rest' heart rate in class?" "Whose heart rate is the lowest after exercise?" and "What is the greatest increase between 'at rest' and 'after exercise' heart rates among the boys in the class?"

The rule of thumb for a normal heart rate, tell children, is 70 to 80 beats per minute — although a healthy person's heart rate may be slightly higher or lower. After vigorous exercise, the rule of thumb is 220 beats per minute minus the person's age.

Once your students have completed their analysis, you may want to display their conclusions on a bulletin board modeled after the class heart chart.

If you have an Apple II series computer and are interested in extending this teaching unit on heart physiology and care, you may wish to contact your local affiliate of the American Heart Association. For $9 each, the Association offers two software packages: for elementary students, there's *Heart Health Education: Heart Medley* (Item #65200-A), and for secondary students, *Heart Health Education: The Heart Anatomy and Physiology* (Item #65100-A).

Jackie Glasthal
New York, NY

HEART CHART

	A	B	C	D	E	F	G	H	I
1	HEART	PAM	PAM	JOE	JOE	FRED	FRED	MARY	MARY
2	RATE	(A.R.)	(A.E.)	(A.R.)	(A.E.)	(A.R.)	(A.E.)	(A.R.)	(A.E.)
3									
4	150								
5	145								
6	140								
7	135								
8	130								
9	125								
10	120								
11	115								
12	110								
13	105								
14	100								
15	95								
16	90								
17	85								
18	80								
19	75								
20	70								
21	65								
22	60								
23	55								
24	50								
25	45								
26	40								
27	35								
28	30								

Using a spreadsheet-created "Heart Chart," students compare their heart rates at rest (A.R.) and after exercise (A.E.).

PAGE MARKER DATA BASE FOR TEACHERS

As a special education teacher and avid computer instructor, I used to spend a great deal of time "rethumbing" through the pages of my favorite computer publications, trying to locate an article or idea that I know I spotted "somewhere." No longer. Now, using a data base program, I can find in a matter of moments all articles specifically related to Logo, special education applications, new hardware, or any job-related topic that has ever interested me. When conducting an in-service workshop, I can even print out an instant bibliography of workshop-related articles for my teacher-students.

The fields that I use in this "page marker" data base are as follows:

MAGAZINE TITLE:
ARTICLE TITLE:
AUTHOR:
DATE OF ISSUE:
PAGE NUMBERS:
TOPIC:
COMMENTS:

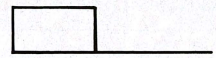
Patricia Shubert
Willard Model School
Norfolk, VA

"COMPUTER USES IN OUR SCHOOL" BULLETIN BOARD

Recently, a camera crew of my students visited other classrooms in our school to discover and photograph ways that the computer is being used in various curriculum areas.

In a horticulture class, for exam-

Is it a pipe. . .or an ax?



Outhouse or delivery truck?

ple, my students found that a data base program was helping the children track flower growth and development. In other classrooms students were using other tool software, such as word processors and spreadsheets, to write stories and learn problem solving skills. I even had the children pay a visit to our school's main office to learn how computers are used at the administrative level.

Using the photos that they took and the information that they gained, the children set up a bulletin board display describing the ways that computers are used in school. They then were able to compare these with what they had learned about computer use in "the real world."

Linda Davis
Missouri School for the Deaf
Fulton, Missouri

PLAY THE COMPUTER PARTS NAME GAME

How many different parts of the computer can your students identify? One easy and fun way to find out is by challenging your students to a round of the computer parts name game.

To play, have children sit in a circle. Start the game off by saying, "I know what the computer has. It has a *monitor.* What is that?" The student seated to your left should respond by providing a definition for the word *monitor.* That child then continues the game by saying "I know what a computer has. It has a *(fill in the name of a computer part).* What is that?" The child to his or her left must then define the word that the first child named before proceeding with a computer part question of his or her own.

If a student cannot properly define the term that he or she is presented with, that child loses a turn, and the child to his or her left is given a chance to provide the definition and continue the game.

The game continues as long as students can think of computer parts to name and define.

Anne M. Pacheco
Educational Consultant
Salem, MA

DO YOU SEE WHAT I SEE? A LESSON IN LOGO LINE DRAWINGS

No matter what their age, your students can stretch their imaginations — and their Logo programming skills — with this visual association activity.

Begin by drawing a simple straight-line illustration on your classroom chalkboard. Have students suggest what it might be. You will be amazed at just how long the list can get! For example, my students suggested that this line with a square at one end (see illustration) might be a stick of butter on a knife, a pipe, an ax, or a chair knocked over on one side. Do your students have any other ideas what it might be?

The second illustration above, my class informed me, might be a supplies cabinet, an outhouse, or the back of a delivery truck. Can your students top these ideas?

After giving students two or three examples, load any version of Logo into your computer. Give each child a turn at the computer to program a "simple" line drawing. Though students may have an idea in mind when they begin to "draw," even "mistakes" make good abstracts to challenge classmates with.

Print out your students' art work and hang it on a bulletin board labeled "Do You See What I See?" Be sure to leave some space between each of the drawings. Encourage children to write suggestions for what each might be on a small sheet of paper to pin alongside the work of art they have in mind. Your young artists will be thrilled that their classmates took the time to think about their art work. They will also get a new perspective on their own line drawings.

Jeanette Parham
Sussex Avenue School
Newark, NJ

HOLD A CREATIVE COOKIE PARTY

Wednesday, February 17 is Chinese New Year. To celebrate, I suggest holding a "creative cookie party" in your classroom! You will need a word processing program, a printer, and a supply of pretzel sticks or cookies.

At least one day before the party, load a word processing program into your computer. Keep the computer monitor turned off, so that students cannot see what others have written on the screen. One at a time, have children come up to the computer and type in a "fortune" such as they would find in the fortune cookies in Chinese restaurants. Tell children to press the RETURN or ENTER key two or three times after typing in each fortune. (Since the children cannot see what they type, this will insure that the next student to use the computer will have a new line to write on.)

When the students are done, read through the file yourself, editing out misspellings and grammatical errors. (You may want to keep a list of these to review with the children later on.) Print out the file and cut the printout so that each fortune is on a separate strip of paper. Wrap one fortune around each cookie or pretzel. (If you end up with more treats than fortunes, invent some fortunes of your own, or use your word processor's REPEAT function to make additional copies of the fortunes that your students wrote.)

As the celebration gets underway, explain to your class that fortune cookies are purely a Chinese-American phenomenon — you'll never find them in restaurants in China! Ironically, Chinese New Year itself is celebrated primarily in Chinese communities outside of China (including the United States). Since the year 1912, China has used the same Gregorian calendar as is used in the United States today.

Mary Ellen Switzer
Del Mar, CA

SEND US YOUR MICRO IDEAS

Do you have computer activities, bulletin board ideas, or management tips you'd like to share? Send them to Micro Ideas, *Teaching and Computers,* 730 Broadway, New York, NY 10003. We'll pay $15 to $30 for each micro idea we publish. ■

THE THINK TANK

TASK CARDS THAT TEACH THINKING SKILLS

Lincoln's Logic

Each month this column supplies four student activity cards for sharpening problem solving skills. This month, inductive and deductive reasoning skills are reinforced through Logo-based language arts activities.

INDUCTIVE AND DEDUCTIVE REASONING

Logic consists of two types of reasoning: inductive and deductive. Inductive reasoning is the process of combining assumptions or hypotheses with available information, in order to reach a tentative conclusion. Deductive reasoning is the process of drawing logical conclusions from presented information alone.

In inductive reasoning, conclusions are usually tentative; the information given is incomplete or not totally reliable. Reaching an "educated guess" is the goal of inductive reasoning.

In deductive reasoning all the facts *are* known. No assumptions need be made. In a reading passage, for example, a child might learn that all mammals are warm-blooded. In the next sentence, he or she reads that whales are mammals. From these statements, the child then *deduces* that whales, being mammals, are warm-blooded.

PREPARATION

1. Punch out the task cards on the next page.
2. Load Logo into your computer. Type in the procedures as they appear.
3. Save the procedures on a diskette under the file name CLUES.

THE PROCEDURES

```
TO AT.LUNCH
  PRINT [] PRINT [DEAR PAULINE,]
  PRINT [THE KIDS IN MS. WILLIS']
  PRINT [CLASS WENT ON A FIELD TRIP]
  PRINT [TODAY. THEY DIDN'T]
  PRINT [ATTEND ANY OF THEIR CLASSES.]
  PRINT [SIGNED, LINCOLN]
END

TO AT.RECESS
  PRINT [] PRINT [DEAR PAULINE,]
  PRINT [THE KICKBALL TEAM IS]
  PRINT [MEETING FOR PRACTICE.]
  PRINT [EVERY TEAM MEMBER PRACTICES]
  PRINT [THROUGH ALL OF RECESS.]
  PRINT [SIGNED, LINCOLN]
END

TO AFTER.SCHOOL
  PRINT [] PRINT [DEAR PAULINE,]
  PRINT [I'VE SEEN HIM! I ONLY GOT]
  PRINT [A LOOK AT THE BACK OF]
  PRINT [HIS HEAD. HE HAS DARK HAIR!]
  PRINT [SIGNED, LINCOLN]
END

TO CUBBIES
  PRINT [] PRINT [CUBBY 1- -]
  PRINT [MATH BOOKS, GOGGLES, TOWEL,]
  PRINT [TWO PENCILS]
  PRINT [] PRINT [CUBBY 2- -]
  PRINT [ORANGE PEELS, OLD SOCKS]
  PRINT [FRIED CHICKEN, SCIENCE BOOK]
  PRINT [] PRINT [CUBBY 3- -]
  PRINT [MUSIC BOOK, INK PEN, BROKEN]
  PRINT [VIOLIN STRING]
  PRINT [] PRINT [CUBBY 4- -]
  PRINT [PENCILS, PENCILS, AND MORE PENCILS!]
  PRINT [] PRINT [CUBBY 5- -]
  PRINT [HISTORY BOOK, TWO BOTTLES OF]
  PRINT [PERFUME, BOX OF CRAYONS]
END

  TO REASONS
  PRINT [] PRINT [1. THE THIEF DOES NOT GO TO THIS SCHOOL.] PRINT []
  PRINT [2. HE OR SHE WAS ABSENT FROM SCHOOL ON THURSDAY.] PRINT []
  PRINT [3. THE THIEF DOES NOT OWN A BICYCLE.]
END
```

PRE-TASK CARD ACTIVITIES

- Present students with definitions for *deduction* and *induction*. Then read aloud a short mystery story, such as one of Donald J. Sobol's *Encyclopedia Brown* cases (Scholastic, Inc.). Can students solve the mystery before Encyclopedia Brown does? What type(s) of logic — inductive, deductive, or both — did Encyclopedia Brown use to solve it?
- Play a game of "Fact, Fact, Conclusion." Present students with two facts and a conclusion, such as:

Fact: Sylvia wears a wig.
Fact: Sylvia is a dentist.
Conclusion: All dentists wear wigs.

Based on the facts, does the conclusion make sense? Why or why not? Think of other examples — some true and others not. Have students analyze each one.

- Before using this month's task cards, students must know how to define and edit Logo procedures.

TASK CARD ACTIVITIES

Task Card 1. Students solve a mystery, using inductive logic.
Task Card 2. Students use logic to match objects with their owners.
Task Card 3. Students develop hypotheses to solve a mystery.
Task Card 4. Students use inductive and deductive logic to identify traits of an unknown person.

POST-TASK CARD ACTIVITIES

- Go back to the game of "Fact, Fact, Conclusion" played in the pre-task card activities. Have students label each group of statements as based on inductive or deductive logic.
- Wrap an object in tissue paper. Can students guess what it is without unwrapping it? What types of clues did they use to make their "guess"?
- Read aloud a passage of historic literature. When do students think that it was written? On what basis do they draw their conclusions?
- Photocopy a news story about a court case. From the facts provided in the article, have students "play judge," and determine the defendant's guilt or innocence. What type(s) of logic apply? ■

Thomas E. Boudrot, author of *Byte-Sized Activities: The Generic Word Processing Book,* is an education specialist for the Division of Educational Technology, Texas Education Agency, Austin, TX.

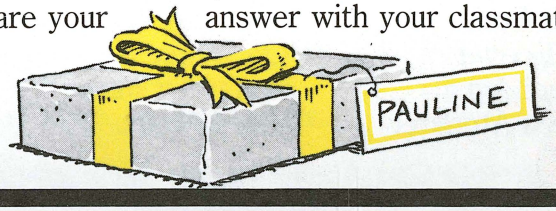
LOGIC 1 TASK CARD

Pauline's Presents

Pauline has found a present on her desk after recess every day this week. She wants to know who is giving them to her. Pauline hired Lincoln, the smartest kid in class, as her detective. Here are Lincoln's suspects:

SUSPECT	HAIR COLOR	HOME ROOM	KICKBALL TEAM
Roy Reader	brown	Ms. Ruiz	yes
Louie Lively	blond	Ms. Willis	no
Juan Tawn	black	Ms. Ruiz	no
Les Sylvester	brown	Ms. Willis	yes
Skip Hopper	blond	Ms. Ruiz	no
Ira Greenblat	black	Ms. Willis	yes

1. Load Logo into your computer. Ask your teacher for the disk of CLUES procedures.
2. Insert the CLUES disk. Type LOAD "CLUES (or READ CLUES) and press RETURN.
3. Read Lincoln's three detective reports. They are filed under the names AT.RECESS, AT.LUNCH and AFTER.SCHOOL. Write any important information down on a separate sheet of paper.
4. Based on Lincoln's reports, can you figure out who the mystery person is? Write the name at the bottom of your information sheet. Compare your answer with your classmates'.



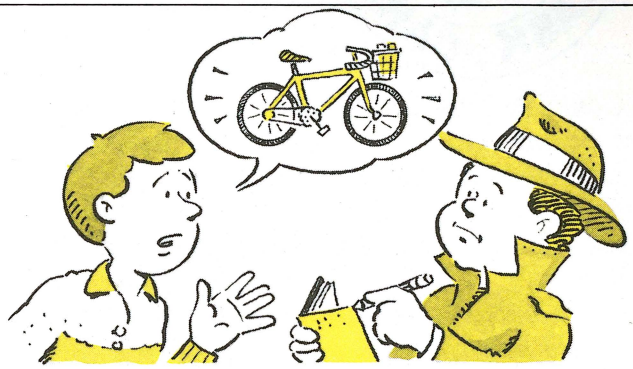
LOGIC 3 TASK CARD

Billy's Bicycle

Complete Task Card 2 before you try the activities on this card.

Billy, with his new 10-speed bicycle, was sure that he would win the annual bicycle race held during gym class. Every kid in school had brought a bicycle to enter. Just before the race, though, Billy's bicycle disappeared from the playground. Lincoln suggested that Mr. Wright, the principal, call the other schools in the area to find out who had been absent from their schools that day.

1. Lincoln has three reasons for what he told Mr. Wright. Load Logo into your computer. Insert the disk of CLUES procedures. Type LOAD "CLUES (or READ CLUES) and press RETURN.



2. Type REASONS. You will see Lincoln's three reasons on the screen. On a separate sheet of paper, write at least three facts that back up Lincoln's three reasons.
3. Share your work with a classmate. Did he or she rely on different facts? Add any new facts to your paper, based on your discussion with your classmate.

LOGIC 2 TASK CARD

Cubby Hole Capers

Complete Task Card 1 before you try the activities on this card.

Five students at Lincoln's school traded lockers without telling their teachers. During spring recess, Mr. Wright, the principal, hired Lincoln to figure out whose "cubby" was whose. Armed with the school roster and the nicknames of the five kids, Lincoln finished the job in no time!

STUDENT	NICKNAME
Paul Portley	Pig Pen Paul
Violet Bow	Violet the Violin
Rita Ecriver	Rita Writer
Samuel Agua	Sammy Swimmer
Andrea Atomizer	Andee Aroma

1. Load Logo into your computer. Insert the CLUES diskette. Type LOAD "CLUES (or READ CLUES) and press RETURN.
2. Type CUBBIES. Carefully read the list of items in each cubby hole. By looking at the list of nicknames above, do you know which cubby hole belongs to which student?
3. Type EDIT [CUBBIES]. After the two dashes following each cubby hole number, write the name of the student that you think the cubby hole belongs to.
4. Print out your new file. How do your answers compare with your classmates'? Discuss any disagreements that you have.

LOGIC 4 TASK CARD

To Catch a Thief

Complete Task Card 3 before you try the activities on this card.

Lincoln found the basket from Billy's bicycle behind the pizza parlor in town. The thief's possessions were still inside. Here's what Lincoln found:

a. a comb with red strands of hair in it
b. two hair clips
c. gym shorts (size: small)
d. three library books, all about poodles

1. Load Logo into your computer. Insert the disk of CLUES procedures. Type LOAD "CLUES (or READ CLUES) and press RETURN.
2. Type EDIT [REASONS]. How many new facts about the thief who stole Billy's bicycle can you add to this file, based on the information above? Be sure to begin each line with a PRINT statement, and enclose each reason between brackets ([]).
3. Save your work under a new file name. Make a printout of it, and compare your work with a classmate's.
4. Use crayons or coloring pencils to create a "Wanted" poster showing what you think the criminal looks like.

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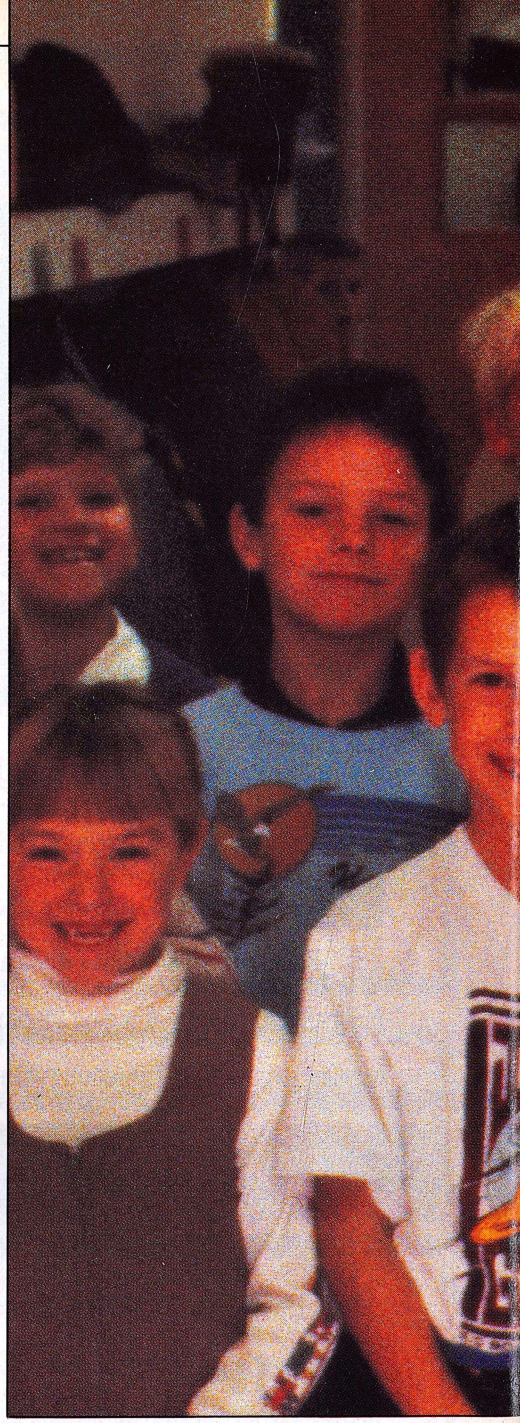
EXCLUSIVE T&C INTERVIEW

COVER PHOTO BY EARL BROCKMAN

DOWN TO EARTH WITH THE NEXT TEACHER IN S·P·A·C·E

What does second grade BASIC have to do with space exploration? Everything, if you're in Barbara Morgan's classroom.



Second graders (above and top left) at McCall-

Editor's Note: *Shortly after the tragic explosion of the space shuttle Challenger in January 1986, President Reagan and NASA declared that the space shuttle program would continue, and that the first citizen to be included in a future space shuttle crew would again be a teacher. Barbara Radding Morgan, a second grade teacher from McCall, Idaho who had trained along with Christa McAuliffe for the first space shuttle flight, was offered, and accepted, the assignment of Teacher in Space Designee. Throughout the 1986/87 school year, Barbara traveled the country speaking for NASA about the space program and and her experiences with it. Last fall, Barbara returned to her second grade classroom at McCall-Donnelly Elementary School while continuing to work with NASA's Division of Educational Affairs.*

In addition to being the next Teacher in Space, Barbara Morgan is a pioneer computer-using educator. In an interview with Teaching and Computers *managing editor Mickey Revenaugh, Barbara offered her perspectives on technology, education, and the future.*

A lesson in BASIC programming.

Donnelly Elementary School in McCall, Idaho are happy to have NASA Teacher in Space Designee Barbara Morgan back in class.

What was your introduction to computing, and how and when did computers come to McCall-Donnelly?

I was first introduced to computers in college, when several of my girlfriends were in engineering programs; their enthusiasm sort of rubbed off on me. But I didn't have much contact with computers again until about six or seven years ago. My husband is a writer, and he'd spent years and years writing out longhand and typing on a typewriter. He started looking into computers for word processing, fell in love with them, and brought one home. I saw right away how much easier it made his work.

Shortly after we got a computer at home, the high school here —which is right next door to the elementary school — got computers. I have a lot of contact with the high school teachers, so I and several others at McCall-Donnelly became very interested in getting computers into our classrooms. We felt there was a real need for computer education here in McCall. We live way out in the "boonies," in the middle of nowhere. McCall is 100 miles north of Boise, and Boise is the biggest city in all of Idaho. So we are pretty rural, and we felt it was important to give our students all of the advantages that students growing up in other parts of the United States would have.

What kind of computer resources do you have now at McCall-Donnelly?

I wish I could paint a real rosy picture, but I can't. We don't have the best of situations here. We have 450 students in grades K-6, and aside from the computers for our special

The teacher as guide: Barbara Morgan at work.

needs kids, we have just one computer for each grade level, which we got grants for about five years ago. When you're constantly moving a computer back and forth among, say, three different classes of third graders, it's hard to keep it running, and it's hard to give each student the computer time he or she deserves.

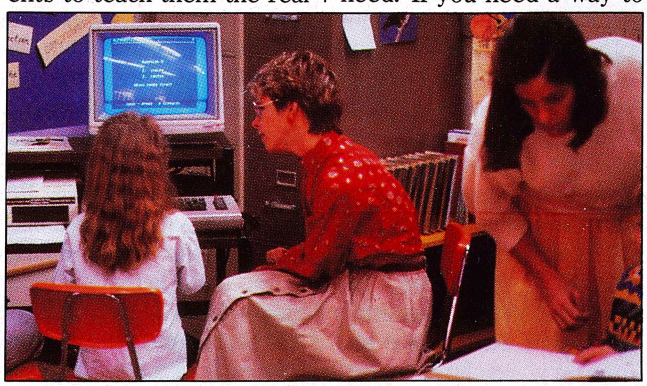
Since we are right next door to the high school, I have been able to work with the computer teacher there to use their lab, which has been very helpful. I take my students there during lunch hour, so we can work in a whole class teaching situation. I have no trouble getting my students to volunteer; they'd rather be in computer class than out playing!

At the elementary school, we are now looking at changing computers to the same brand as they have at the high school, and building our own computer lab. We're doing it slowly, though — we're hoping to get one new computer a year, and we're looking to grants to do it. Luckily, we have a new PTA that's wonderful; they've been very active in helping us to set up a better computer situation.

You've come up with some rather creative strategies for tackling this lack of adequate equipment and time.

We have found that there are many different ways to get computers into your classroom. For example, one of the companies down in Boise is going to donate an Apple to us next month — in exchange for an ice sculpture at our Ice Festival in February!

In terms of time, I really rely on my parent monitors. Each year, before I get the students going on the computers, I send out a letter to parents asking for volunteers to come in and help the students. We usually have some real enthusiastic parents, and some very scared parents who want to learn but are afraid to use the machines. The enthusiasm catches on, though . . . it's a very small town where everybody knows everybody else, and the word gets out that this is a fun thing to do. I'll set up several afternoon meetings with parents to teach them the real basics, like how to turn the computer on and off. We build from there, and as soon as the parents feel they're at least one step ahead of the students, I schedule them to spend a half hour to an hour each day working in my classroom with the students on the computer. What it ends up being, and the parents realize this fairly quickly, is that the students are much more adept than they are, and much more willing to take chances with the computers. So the parents end up basically monitoring what's going on, and being there to troubleshoot. The neat thing is that everybody learns together, parents as well as students. Many of the parents end up getting computers for their children at home, and several of them have asked if they can come in during off hours to work on the computer themselves.



In the mornings, students work at the classroom computer with parent volunteers like this one.

With a class of second graders and limited computer resources, what exactly is your approach to "computer education"?

My primary interest is teaching BASIC programming, and part of that comes out of practicality. Here in McCall, we don't have a lot, so people make do, and they're very creative. People here build their own houses, and they also build the tools they need. If you need a way to shovel off a flat roof, and you have two or three feet of snow, you end up jerry-rigging a huge snow shovel — something you can't buy in the store. People make their own tools, and use the tools to meet their own needs. I think there's a direct relation between that and learning to use the computer in the classroom. We don't have a lot of money to buy subject-specific software, or word processing programs, or Logo programs. That's why I teach BASIC programming: the kids learn to use the computer as a tool. They learn to make their own simple programs, and to use those programs to meet their needs.

I think there are a lot of other benefits to teaching BASIC that you don't necessarily get from "just" using commercial software. I feel that it's a real good tool for teaching my students basic logic and problem solving. It's a good tool for understanding language. And I've also found it's a wonderful tool for teaching proofreading, which is really a hard skill for students to learn.

Teaching programming can be hard to do with only one computer, though. As I mentioned, I schedule whole class activities at the high school during lunch hour. The computer in my classroom is used several hours every morning, with a parent monitor, to reinforce programming skills or to use subject-specific software.

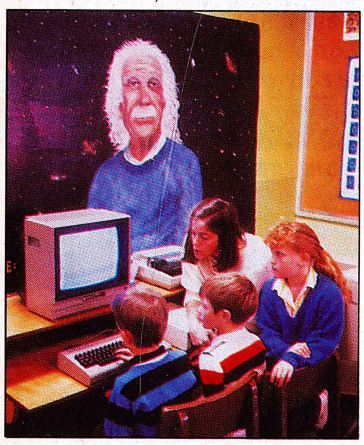
Now we'll ask you to daydream a little: if there were unlimited resources, what would your computer "wish list" look like for McCall-Donnelly and schools like it across the country?

I would definitely have a computer lab in every

school, with a maximum of two students per computer at a time. The lab would be staffed by professional staff, aides, and/or volunteers from the community.

In addition to the lab, though, I would like to see three to five computers in each and every classroom, for reinforcement of lab work plus use of subject-specific software.

I'd also have modems, an adequate number of printers, plus an unlimited budget for software and in-service training for teachers. If we had to prioritize the software, I'd buy general programs first, such as word processing, graphics, Logo, and spreadsheets, and THEN subject-specific software, which seems to require very careful budgeting of time for very busy teachers.



Computers "open the future."

Having a lab and a computer in the classroom would give me the flexibility that I would like to be able to teach the BASIC programming *and* to use the word processor and graphics programs and so on. One of the things that makes computers so wonderful is the variety of ways they can be used, and to have them in the lab and in the classroom would really maximize their use.

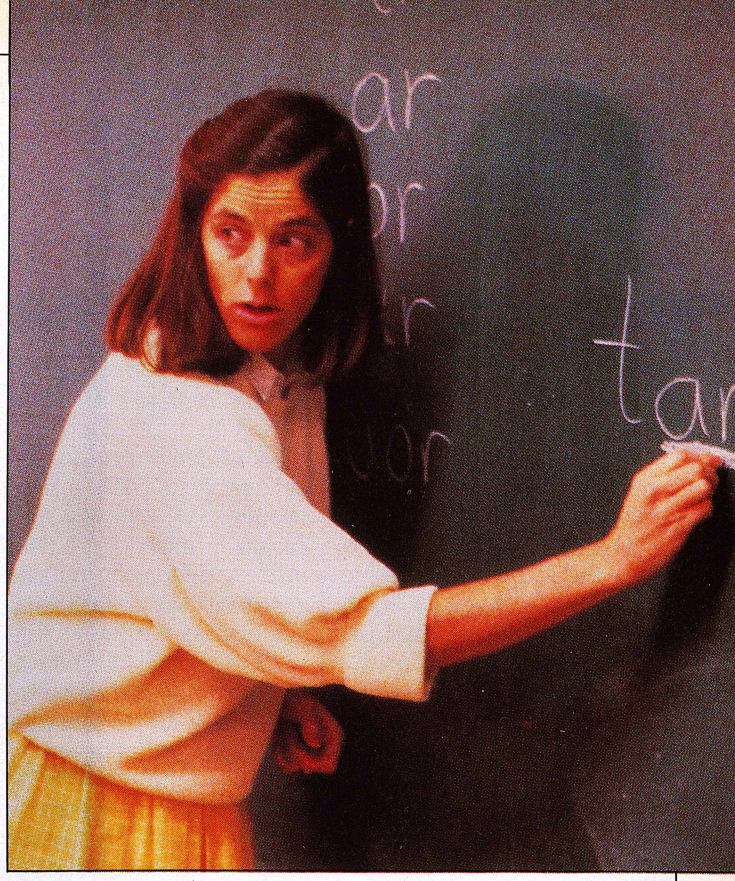
Part of my dream is the possibility of opening the lab up to the community too, whether it's for teaching adults how to use the computer or allowing them to come in and do their own personal work. There would be benefits to this aside from the sharing of costs: anytime you can get people learning together, I think the enthusiasm factor goes up by a million. That's why I don't mind if my dream computer lab doesn't necessarily have one computer per student: with two students, you get that exchange of ideas, that sense of teamwork, that you can't get working alone.

Tell us more about the community of McCall, and the role of technology there.

McCall is a very down to earth place, but it's also very high up — about 5,000 feet! We're surrounded by the Idaho wilderness, so kids here get very deep and good understanding of nature and natural resources — they live it every day.

McCall has a population of about 2,000. It used to be a logging town, but we lost the sawmill about eight years ago; it's been struggling ever since then, trying to find its identity. The economy still depends a lot on logging, but also on tourism and the service businesses that go along with it. Beyond that, the U.S. Forest Service is one of the biggest employers here now.

Technology is becoming more important in the world of work here in McCall. Introducing computers in the classroom came first, but very quickly after that, our secretaries at the schools got computers. The Forest Service is another example: we take our students there on field trips and have Forest Service employees come over to the school to talk about how they use technology in their work.



Language skills: BASIC programming reinforces them.

Because we're so remote, we really depend on technology for communication. For me and I think for many of my students now, it's about being able to keep in touch with the larger world. That's so important: I mean, life can go on without it, but that's not what people here want. It's very nice to be part of nature, and sort of let the world go by, but everybody here also feels that we're explorers, adventurers — we want to be a part of that larger world, and technology certainly helps us do that.

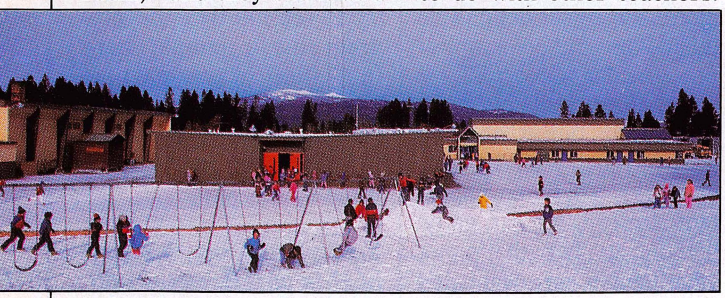
That's one reason why the Teacher in Space program meant so much to me, too. I've always felt that when you can't bring your students to the larger world, you have to bring the world into your classroom. The experiences I've had I've been able to share with my fellow teachers and with my students. Last night I spoke before the PTA about some of my experiences, and one of the parents afterward came up to tell me that the program made people here feel they were part of what's going on in this country, that they really were partners in the space program.

You're very much a part of this small, rural educational community, yet you're also part of the global, futuristic enterprise of space exploration. You must have a unique perspective on the future, and what kind of education we should be providing for it.

I'm grateful for the experiences I've had in the Teacher in Space program, because it has given me a better glimpse of the future. One thing I've learned is that although we can't predict the future, we sure can help shape it and give it direction. The more we can dream about the future, the more opportunities we're going to have for

our students. I try to give my students a very open-ended view of the future. There's a danger that because the earth is so fragile, the future can look kind of pessimistic: our students foresee spending the rest of their lives taking care of this "aquarium" of a planet, and there's no opportunity in it, no adventure. That's why space travel is so exciting and inspirational, because instead of being closed, the system opens up and our young people can look forward to being as much explorers and adventurers as our forefathers were. They become better students, too, if they can see some possibilities for their own futures, because they understand better the importance of a good education.

A lot of people talk about the "classroom of the future" or "the new classroom," and they see it as a movement toward teaching how to learn. I think they envision the classroom of the future as being filled with computers, with the kids all working at their own rate, in their own little areas, pursuing their own program of study. I feel real strongly about that. I'm not a teacher that very often stands in front of the classroom and lectures; more often we explore activities together, and I'm more like a guide. And we do need to teach kids the tools so that they can learn how to learn. But I definitely feel that teachers are still a very important part of the classroom, and that there's a basic background knowledge that everyone should learn — that's our cultural heritage, that's what keeps us together. I'd like to see a balance.



McCall-Donnelly serves some 450 students in grades K-6.

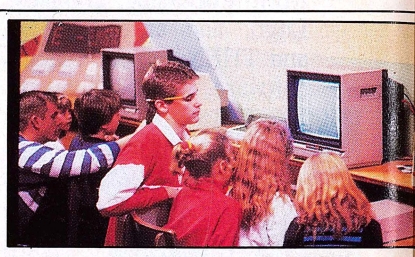
What can teachers do to assist each other in educating for the future?

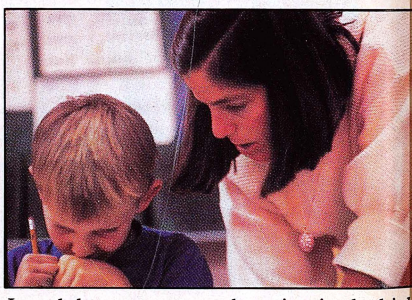
We all tend to get caught in our own little classrooms — I know I get caught in mine — so it's a matter of stepping outside a little bit, and being able to share what we know with each other. That's one of the other things I got from working with the Teacher in Space program — not only learning knowledge from NASA and the space program that I could share with my students and community members and people all over the country, but the sharing I was able to do with other teachers. You have to make a commitment to remember that there's more out there than what's just in your own classroom. Of course, structure does help — the more you can get your school to set aside opportunities for sharing your ideas, the easier it's going to be. Here at McCall-Donnelly, we're always talking informally among ourselves; but when we set up special opportunities — for example, when our reading association holds a meeting for our own teachers to share the ideas that they're using — we get a lot more enthusiasm and a lot more sharing, and it spills over. The next day, you can hear teachers sharing even more ideas with each other. It tends to snowball.

The road to McCall: A hundred miles from Boise and 5,000 feet above sea

You recently became a parent for the first time. How has that affected your view of education today?

I feel that all our sons' and daughters' futures are very bright. We hear a lot about the bad things about education in this country; I like to remind people about all the good things. I mean, every single person in this country has the right to a free education — there aren't many places where you can say that. We do have good teachers across this country, and we have an excellent educational system — although there's always room for improvement. I feel confident that my son will have an excellent education and have the world open to him.





Lunch hours are spent learning in the high school computer lab.

Our experience with technology in the modern age has not all been positive. We have seen the destructive power of technology used for war, and the tragic consequences of technological mishaps, as in the case of the space shuttle Challenger. In educating for the future, how do you handle this aspect of technology and the fears that it raises?

One of the most common fears of technology that people talk about is the fear of using computers; but I'm sure every reader of your magazine knows, as I've discovered, that kids do not have that fear. The computer is so engaging a learning tool, that they're real anxious to get in there and use it.

In general, students have less fear of technol-

level, the town's population is 2,000.

ogy than anyone else. I'm going to talk about the Challenger accident for a minute. Obviously, that affected all of us very, very deeply. When I went and visited schools after that, all the students' questions at first were about the accident, especially the "people side" of what happened — we all have hearts, and that's the hardest part. But after those questions, immediately the students shifted to: What's the food like on the space shuttle? What's it like to be weightless? What kinds of jobs are available in space? What do I have to do to be an astronaut? I don't think fear was really there. Instead there was some worry, some concern, and especially a deep compassion for the feelings of the people involved. But these kids were also ready to go into space themselves.

We certainly have to educate ourselves and our children to take a constructive and positive approach to technology. We're responsible for making good choices. But I believe the best way we can do that is through first-hand experience with technology, because we learn best by doing, through problem solving and teamwork.

How do you account for your remarkable optimism about technology, education, and the future?

Being a school teacher, I look at the positive. If we didn't look at the positive, we wouldn't be very good teachers. That's why we went into the field: because we are excited about the future. Our future is sitting in our classrooms, in those students who walk through the door every morning when the bell rings, eager to learn. That's our responsibility. And it's not a burden, it's a joy. ■

TEACHER IN SPACE EDUCATION FOUNDATION

"The future is in the stars. This foundation will help our students reach for them." That's how Teacher in Space Designee Barbara Morgan describes the Teacher in Space Education Foundation, a NASA "spinoff" formed to promote educational innovation.

The foundation was actually conceptualized in 1985 by the finalists and semi-finalists in the Teacher in Space competition. Their aim was to broaden and perpetuate the original goals of the NASA program: to enhance the prestige of the teaching profession, to increase public awareness of the importance of math, science, and technology-related education, and to use space as a catalyst in the teaching of all disciplines.

When the foundation was formally launched in March 1986, its founding members — the 112 Teacher in Space semi-finalists and finalists — announced that their efforts were in part a tribute to the memory of Christa McAuliffe, for her "courage and dedication to education."

The foundation's plans include an annual awards program for teachers who have "designed innovative learning activities associated with technology and America's frontiers"; regional, national, and international forums for the exchange of innovative ideas among teachers; and a national speakers bureau of teachers who have participated in the foundation's programs.

As founding members, the 112 "Space Ambassadors" invite all teachers to join the foundation. Members receive the triannual journal *Educators Today Touching Tomorrow* and will be eligible to compete for the foundation's space educator fellowships.

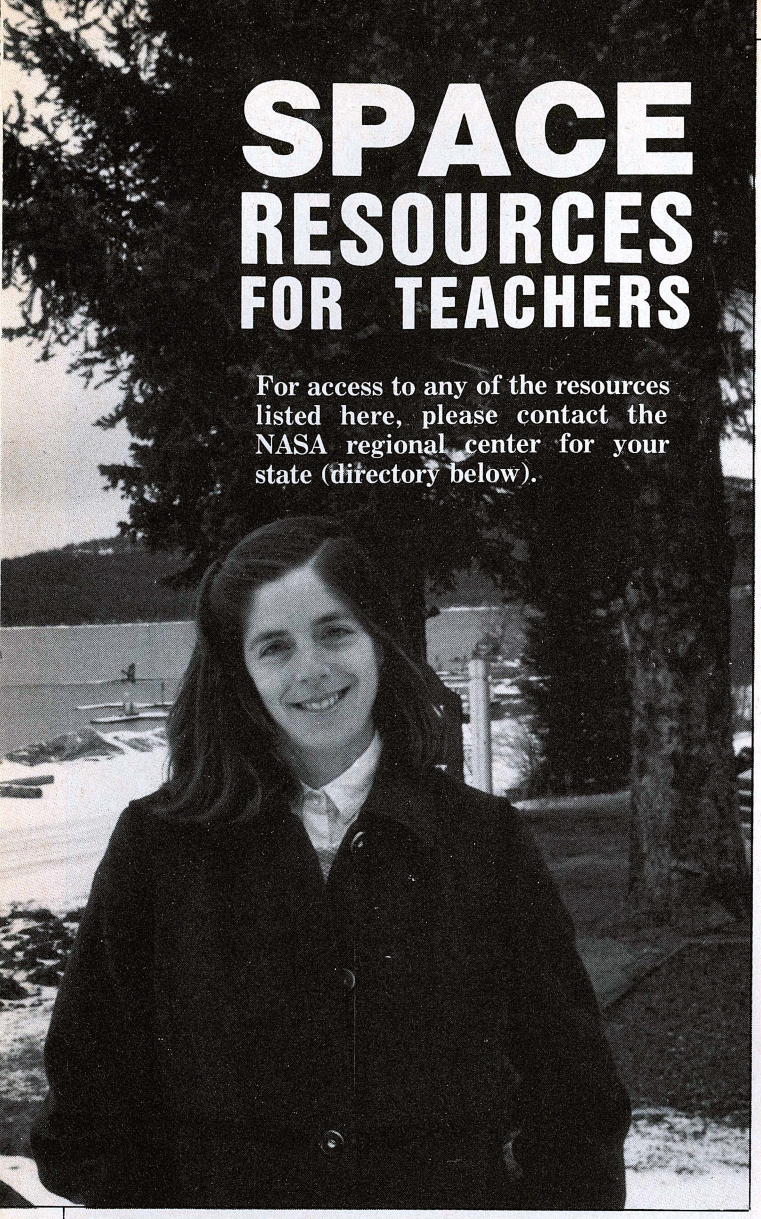
For more information, contact: Teacher in Space Education Foundation, 600 Maryland Avenue S.W., Suite 600, Washington, DC 20024, 202/484-9240.

Pointers on thinking: "I feel that all our sons' and daughters' futures are very bright."

(continued on page 26)

SPACE RESOURCES FOR TEACHERS

For access to any of the resources listed here, please contact the NASA regional center for your state (directory below).



Teacher in Space

In addition to preparing Barbara Morgan for her eventual journey aboard the space shuttle, the Teacher in Space program remains active in supporting the work of the NASA "Space Ambassadors": the 112 nominees selected in the 1985 competition for Teacher in Space. Now back in their elementary and secondary school classrooms, the Ambassadors help promote aerospace education among fellow teachers in their home states, and periodically convene for NASA training and information conferences. The next gathering of Space Ambassadors (and other interested educators) will be a Pre-Launch Education Conference when Barbara Morgan has been scheduled for flight.

Educational Technology

A new NASA office is bringing together high technology and aerospace education through production of national teacher videoconferences, computer software and interactive laser discs, and other projects. The satellite videoconference series has already been launched, with over 20,000 teachers across the country tuning in on October 20 and November 18, 1987 for interactive programs on the Hubble Space Telescope and Space Shuttle Flight Status, respectively. The next two videoconferences will focus on the Space Station (February 16, 1988) and Launch Vehicle Preparation (March 16). In addition, the Office of Educational Technology expects its SpaceLink online education information service to be up and running as of January, 1988, providing teachers with access to a wide variety of space-related resources — including lesson plans.

Spacemobiles

NASA's traveling Aerospace Education Services Project and its cadre of lecturers conducts upwards of 10,000 school assemblies and workshops per year. The program will be expanded over the next five years to reach geographically underserved locations around the country.

Other Services

In conjunction with the National Science Teachers Association (NSTA), NASA's Space Science Student Involvement Program sponsors competitions providing students in grades 7-12 with the opportunity to design experiments related to aerospace science. Another joint NASA-NSTA project is NEWMAST, a professional development program for teachers of science and math for grades 7-12. NASA also works at the university level to enhance the study of science, mathematics, and engineering, and recently began negotiating with university Deans of Education to provide preservice training for aspiring teachers.

Publications

NASA offers an extensive line of books, pamphlets, posters, and curriculum packages to help you teach about space. Two of the more extensive packages are *Working in Space* and *Living in Space,* which are filled with information and activities geared to specific grade levels. Publications also include newsletter-style periodicals such as *NASA Facts, NASA Educational Briefs,* and the *NASA Report to Educators.* NASA recently made a commitment to target at least 30 percent of its materials to elementary students and teachers over the next five years.

FOR ALL NASA EDUCATIONAL SERVICES AND MATERIALS

IF YOU LIVE IN: Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming
CONTACT: NASA Ames Research Center, Attn: Teacher Resource Center, Mail Stop 204-7, Moffett Field, CA 94035; 415 694-6077

IF YOU LIVE IN: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
CONTACT: NASA Goddard Space Flight Center, Attn: Teacher Resource Lab, Mail Stop 130-3, Greenbelt, MD 20771; 301/286-8570

IF YOU LIVE IN: Colorado, Kansas, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas
CONTACT: NASA Johnson Space Center, Attn: Teacher Resource Room, Mail Stop AP-4, Houston, TX 77085; 713/483-8696

IF YOU LIVE IN: Florida, Georgia, Puerto Rico, Virgin Islands
CONTACT: NASA John F. Kennedy Space Center,

COPY

NOTES

WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

TEACHER'S GUIDE

Architecture is everywhere. This poster uses interesting facts and hands-on activities to develop children's awareness of architecture and its principles as well as the growing use of computers in architectural design. The flipside of the poster contains three blackline masters for you to reproduce which reinforce and extend the poster material. (Special note: The Intermediate and Advanced worksheets both require "building materials" which you will need to prepare in advance. See details below).

USING THE POSTER

The poster is divided into five main sections. Here is how to get the most from each.

It's a Fact That . . . Warm up with these architecture facts and such discussion questions as: What does the word "architect" tell about the job? What may be the reasons that there are so many more male architects than female, and can this be expected to change? How many other building materials (besides bricks) can students think of, both natural and humanmade? How many acres of floors are in the two towers of the World Trade Center? (220) How many windows in each building? (21,800). What is the symbolism of the Capitol's height, and what other kinds of buildings involve symbolism?

Shelter Then and Now Assign students to collect information about shelter through history and around the world. Have them draw and label examples of shelters, listing the types of building materials used. Students will then gather and organize information on their own homes in the shelter data base activity. You might have them graph their findings using graphing software such as *Easy Graph II* (Grolier) or *SVE Autograph* (Society for Visual Education).

Spot Those Shapes When students have found all eight shapes (circle, semicircle, square, triangle, sphere, dome, cube, and cone) in the poster buildings, look together for these same shapes in the architecture of your classroom. Discuss why these shapes keep recurring. By drawing buildings using only these few basic shapes, they will begin to understand the strict geometric considerations most architects face — and also the great variety of designs possible through the combination of these shapes.

How Architects Use Computers You may need to discuss such terms as mouse, light-pen, zoom, CAD, artificial intelligence, and building code laws. To demonstrate viewpoint, hold up a solid object and rotate it. Call on students to suggest ways computers might make work easier and more fun for architects in the future.

Be an Architect First explain the difference between an elevation (front and side view of a building) and a floorplan; although students will be working only with floorplans, an architect needs to see both. Encourage students to use all the software's functions (rotate, mirror, and so on) to simulate the architect's CAD tools. Measuring their drawings will help show students the importance of mathematics in architectural design. As an extension, explain "scale modeling" and show students how to convert inches or centimeters in their drawings to feet or meters of actual size.

USING THE WORKSHEETS

This month's worksheets expand upon the concepts presented on the front of the poster.

House-Wear This worksheet helps K-2 children explore the analogy between types of clothing and parts of a house. When they've completed the worksheet, let students draw (by hand or on the computer) more clothing and accessories which are like parts of a building.

To correctly complete the worksheet, your students should draw lines connecting the following pairs: hat/roof; shoe/floor; shirt/wall; socks/carpet; button/doorknob; eyeglasses/windows; pocket/closet. On the Bonus activity, answers will vary.

Extra Strength Set up a separate work area for students to complete this worksheet one at a time. Cut out 26 cardboard or posterboard strips: 18 strips measuring 1"x 8" and eight strips measuring 1" x 12". Punch a hole near each end of each strip. Provide a box of metal brads for connecting the strips.

Students will find that only the triangle is sturdy by itself. All the other shapes lean and collapse until triangles are created within them. Students should summarize this discovery in a short word processing report at the end of the exercise.

Build Your Dream House In this activity, older students will build a three-dimensional architectural model from a floorplan they create on computer with Logo or a graphics program. In advance, collect plenty of foamcore or corrugated cardboard for walls; cut into two-inch wide strips with an razor or knife along the metal straightedge ruler. Provide each student with one 8-1/2" x 11" cardboard base, a ruler, white glue, and crayons or markers. As they complete their drawn floorplans, students will bring their wall measurements for you to cut from the foamcore or cardboard strips. You can cut out doors and windows for them too.

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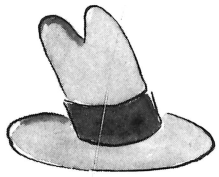
NAME: _____

HOUSE-WEAR

DIRECTIONS: Your clothes are like parts of a building. Draw a line from each piece of clothing to the part of a building it is like.

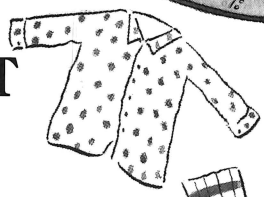
CLOTHING

HAT

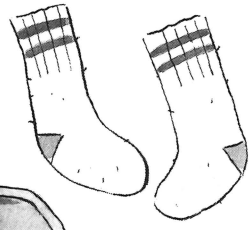


SHOE

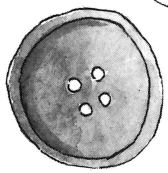
SHIRT



SOCKS

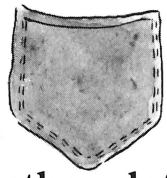


BUTTON

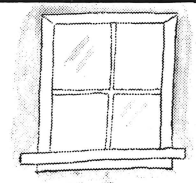


EYEGLASSES

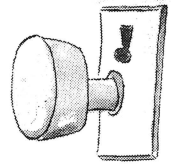
POCKET



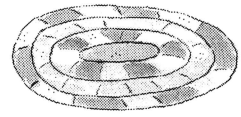
PART OF BUILDING



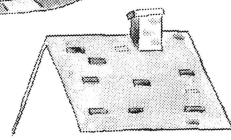
WINDOW



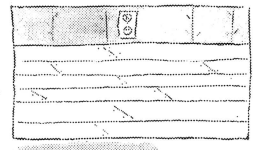
DOORKNOB



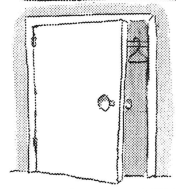
CARPET



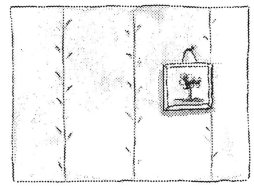
ROOF



FLOOR



CLOSET



WALL

BONUS: What other clothing can you think of that's like a building part? Draw a picture of it on the other side of your paper, or on the computer. Be sure and give your picture a name!

COPY

INTERMEDIATE

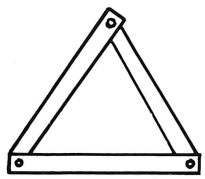
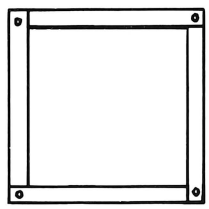
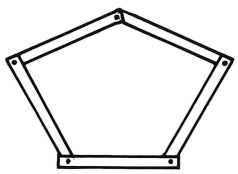
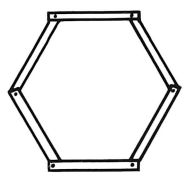
WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

NAME: _____

EXTRA STRENGTH

DIRECTIONS: Architects use strong materials to build with. They also use strong shapes to hold buildings up. Here's how to find out which shapes hold up the best.

1. Your teacher will provide you with cardboard strips and metal brads. Connect the shorter strips to make each of the shapes below. Which shapes are sturdy? Which shapes lean and collapse? Put a check in the correct box to describe each shape.

		Sturdy	Not sturdy
1		_____	_____
2		_____	_____
3		_____	_____
4		_____	_____

2. Try adding add one or two long strips to the collapsing shapes to make them sturdy.
3. Now take a guess: What's the sturdiest, strongest shape for architects to use?

On the word processor, write a short report explaining your guess. Give examples of ways that architects use this shape.

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COPY

ADVANCED

WORKSHEET TO COPY AND USE WITH THIS MONTH'S POSTER

NAME: _____

BUILD YOUR DREAM HOUSE

DIRECTIONS: Follow these steps to design and build an architectural model of your DREAM HOUSE.

Step 1: Imagine your very own Dream House, and all of the rooms it might have. Then use Logo or a computer graphics program to design a floorplan for this Dream House. (Review "Be An Architect" on the front of the poster if you need help.) Make the floor plan big enough to fill up most of the monitor screen.

Step 2: Print out the floorplan and glue it onto the cardboard base your teacher gives you. Mark clearly where the doors and windows will go.

Step 3: Use the ruler to measure the wall lengths. Write each length on a piece of paper.

Step 4: Show measurements to your teacher who will cut the walls for you. Your teacher will also cut out the doors and windows in the walls.

RUSSO & SONDER ARCHITECTS, NYC, & SKOK SYSTEMS INC.

Architects at work.

Step 5: Use crayons or markers to decorate the inside walls with pictures, curtains, furniture, and anything else you can think of to go inside your Dream House. On the outside walls, draw shutters, bricks, shingles—whatever you like for the outside of your Dream House.

Step 6: Put glue on the bottom edge of each wall. Stand the walls up on top of the cardboard base, over the floorplan lines. Let your model dry overnight.

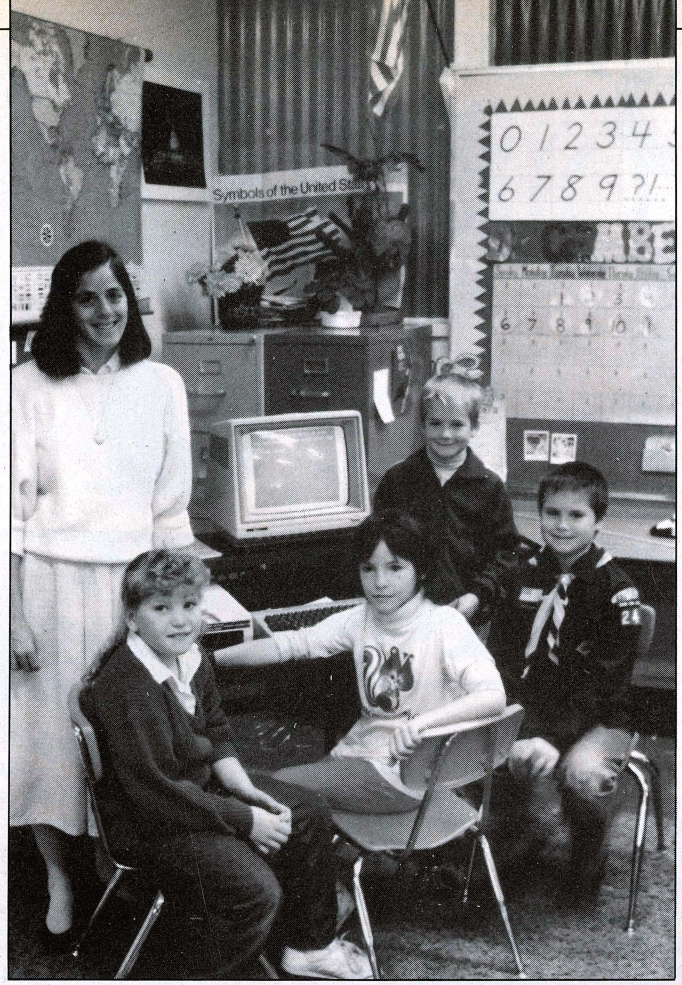
Step 7: Admire your architectural creation.

Attn: Educators Resource Library, Mail Stop ERL, Kennedy Space Center, FL 32889; 305/867-4090 or 867-9383

IF YOU LIVE IN: Kentucky, North Carolina, South Carolina, Virginia, West Virginia
CONTACT: NASA Langley Research Center, Attn: Teacher Resource Center, Mail Stop 146, Hampton, VA 23665-5225; 804/865-4468 or 865-3017

IF YOU LIVE IN: Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
CONTACT: NASA Lewis Research Center, Attn: Teacher Resource Center, Mail Stop 8-1, Cleveland, OH 44135; 216/267-1187

IF YOU LIVE IN: Alabama, Arkansas, Iowa, Louisiana, Missouri, Tennessee
CONTACT: Alabama Space and Rocket Center, Attn: NASA Teacher Resource Room, Huntsville, AL 35807; 205/544-5812 or 837-3400, ext. 36

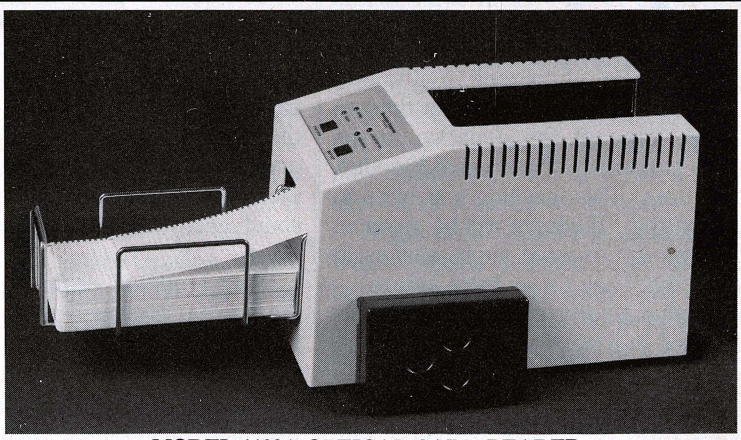


IF YOU LIVE IN: Mississippi
CONTACT: NASA National Space Technology Laboratories, Attn: Teacher Resource Center, Building 1200, NSTL, MS 39529; 601/688-3338

For information about NASA Jet Propulsion Laboratory activities (including space exploration), contact: NASA Jet Propulsion Lab, Attn: Teacher Resource Center, JPL Education Outreach, Mail Stop CS-530, Pasadena, CA 91109; 818/354-6916

NASA is also working to establish Teacher Resource Rooms at universities and other accessible locations. Contact your regional center for a listing of alternate sites. ■

Don't test your ability to test your students' abilities...



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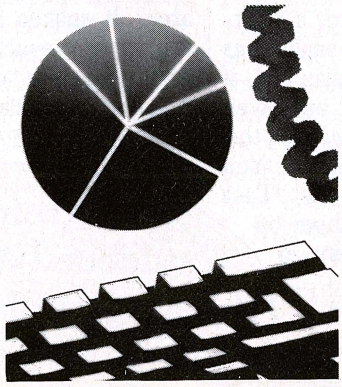

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Teaching Unit

Snake Data

What has no voice, ears, arms, or legs, has only one working lung, smells with its tongue, has been around longer than people have, and is, for the most part, not very well liked?

The snake, of course!

In fairness to snakes, it is time to dispel some of the negative myths that surround these cold-blooded creatures. This teaching unit aims to do just that. Students will be given an opportunity to learn about snakes in ways that they never have before — ways that exercise the thinking skills outlined in Bloom's Taxonomy of the Cognitive Domain (see box on page 31.) At the same time, students will learn how to design, organize, and use a computer data management program.

In order to complete this teaching unit, you will need at least one computer, a data base program, a printer, access to books about snakes, at least one set of encyclopedias and, if possible, films, filmstrips, and even guest experts on *herpetology,* the study of reptiles and amphibians. You will also need a copy of the "Test Your Snake Sense" worksheet on page 32 for every student in your classroom.

If you have never used a data file software program before, or are still uncertain about the way one works, refer to the box labeled "Data Base Primer" on page 33.

TESTING SNAKE SENSE

Finding out what they know (or think they know!) and don't know about a given topic can spur students to learn more. Get this teaching unit off to a super start with the "Test Your Snake Sense" worksheet on page 32. Have students complete the test quietly at their seats, then go over the worksheet as a group. (Answers and additional information about each question appear on page 33.)

Were students surprised by any of the correct answers on the test? Did the answers raise any new questions about snakes?

For example, if there are "more than 100 species of snakes in the United States alone," just how many more are there? What are the names of these species? Where can they be found? Are there any in your local area? If snakes are not cold to the touch, what exactly do they feel like? And what does "cold blooded" mean, if *not* cold and slimy?

As you and your students go over the worksheet, jot down on the chalkboard any questions that students raise. Encourage them to brainstorm as many other questions about snakes as they can think of. Then hold a discussion about the students' actual experiences with snakes. Do any of your students own one as a pet, or know of anybody that does? Have they ever had an opportunity to pick up a snake or stroke one's scales? What did it feel like?

If possible, follow up your brainstorming session with a filmstrip or movie about snakes, a visit to a zoo (preferably a petting zoo!), or a visit by a herpetologist to your classroom.

Stretch your students' research and thinking skills while clearing up common misconceptions about snakes.

SNAKE DATA DESIGN

Your students are now ready to apply the knowledge that they have gained so far toward gaining even more knowledge.

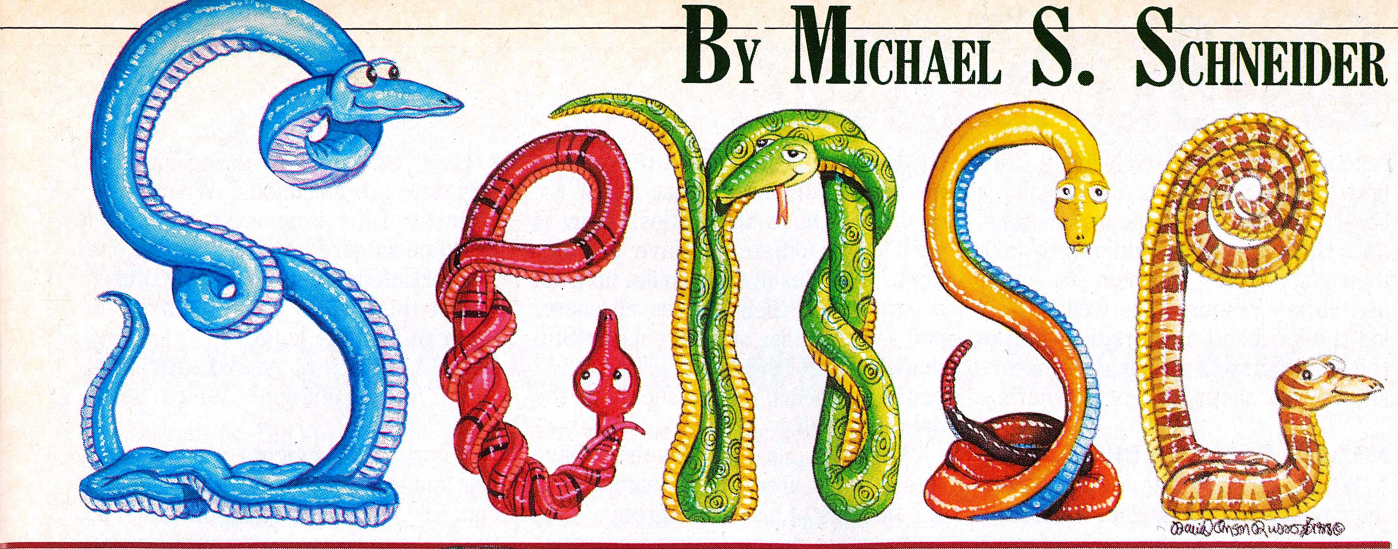
Guide your students in extracting data field names from the questions they've already formulated and the initial information they've received. For example:

SPECIES NAME:
LOOKS LIKE:
FEELS LIKE:
POISONOUS (Y/N):
WHAT IT EATS:
HAS FANGS (Y/N):
WHERE FOUND:
DEFENSES AGAINST ENEMIES:
SIZE AT MATURITY:
DIURNAL OR NOCTURNAL:

Other fields that you and

SENSE BASE

By Michael S. Schneider



your students may want to include are the following:

ENDANGERED (Y/N):
WEIGHT AT MATURITY:
MAXIMUM SPEED:
NUMBER OF EGGS IN BROOD:
AVERAGE LIFESPAN:
OTHER:

If students have never worked with a data base before, you may want to supply the above field names yourself, or at least two or three samples to get the students started. As a class, have students select as many field names as your data base program will allow for a single record.

Be sure that the fields students select are appropriate to any and all species of snakes. For example, students are fascinated to learn that some snakes are able to make a bad smell (like a skunk) when threatened. Students will want to know exactly which snakes can do that and how. With your guidance, students will broaden the question to, "What do snakes do to scare away their enemies?" This question would lead to the field name DEFENSES AGAINST ENEMIES.

"SNAKE SENSE" TEAMS

Once the data fields have been selected, guide your students in deciding who will research which snake. With at least 2,700 species to choose from, there is little chance of duplication. Even so, tell students, there are more scientific ways of dividing the work load than simply by having every student randomly select a different snake to research.

One way is by dividing up into "snake sense teams" to research different snake families. A list of common snake family names, their scientific names, and the number of species found within each one appears on page 30. If this is the way that you and your students decide to organize your data file, don't forget to add a field to the data file labeled SNAKE'S FAMILY NAME.

Instead of snake families, each snake sense team could research snakes common to specific regions of the globe. Or the teams might research snakes by natural habitat — terrestrial, arboreal, semi-aquatic, or aquatic. Each team might research snakes of a different color, or possibly group the snakes into the categories small, medium, and large.

Be sure that students are clear about the category of snakes they and their teammates will be researching. The more specifically delineated the job of each team, the less chance there will be of duplication, and the more easily students will be able to compare and contrast their snake data later on.

COLLECTING SNAKE FACTS

When the teams have their assignments, have them work in the library to create a list of snake species that fit into their assigned categories. Within each team, give students leeway in deciding exactly which snake each student will research. They may, however, wish to select a team captain to oversee the process.

When each student is clear about which species of snake he or she will be researching, use your own classroom data management program to demonstrate to students how fields in a data file are established. Enter the field names you and your students have decided upon, and print out a blank data record. Make two photocopies for each student, one to fill out as a sample and the other to complete in the course of their own research. Lead your students through filling out the sample with information about a snake that none of the students have been assigned, or follow the example on page 34. Have students refer to this sample when they have questions about the information that belongs within a field, or the way that the data should be recorded on their own data records.

As they begin their snake

CURRICULUM CONNECTIONS
SCIENCE
Studying reptile characteristics and behavior
Using science process skills

David A. Russo

Snake Sense

research, students will likely turn first to the library; a list of snake books to look for appears on page 34 . But encourage students to take their fact-finding mission to other non-library resources as well, including the local zoo, universities, herpetological clubs, television nature shows, pet shops, and pet owners.

SNAKE DATA ENTRY

When students have completed their pencil and paper data records, it is time for them to type the information into the computer data file. This need not be a mindless task, but instead an opportunity to test their new snake smarts!

Have each student inputter work with a fact-checker from his or her snake sense team. As the fact-checker follows along on the inputter's pencil and paper data record, the inputter should enter as much of the data as he or she can from memory. How many fields can the inputter fill in without asking the fact-checker's assistance?

This approach to data entry will be more challenging for the fact-checker, too. He or she will not only be checking for typos and misspellings, but the inputter's facts themselves.

ANALYZING SNAKE FACTS

Now that the data file is chock full of facts, there are many ways that you and your students can choose to examine, or analyze, the information collected.

Begin with discussions within each snake sense team. What are the similarities among the snakes researched by team members? What might account for these similarities? How is each snake different? Have the students within each team make up a list of traits that their snakes all share, and a parallel list of differences. (Students can do this using either their paper and pencil record sheets or the data file itself.)

When the class reconvenes, have one student from each team report the findings of his or her group. Then hold a class discussion on similarities and differences among the groups' reports. Can your students propose any hypotheses based on this discussion? For example, if two teams report that all the poisonous snakes they studied have fangs, students may hypothesize that poisonous snakes always have fangs. Keep a list of such hypotheses, then assign students to do additional research to prove or disprove them.

GREAT SNAKE SEARCHES

Another way to have the students analyze their data base information is by sending them on "snake searches" through the data file. Here are some sample search questions:

- Many people use a rhyme to help them identify poisonous snakes from nonpoisonous ones: "Red on yellow, kills a fellow; red on black, venom lacks." Based on the information in the data file, is this always true?
- In what habitat(s) do snakes usually live longest?
- How many of the snakes in the data file might be found in this state?
- How many of the snakes found in this state are poisonous? What family do most of these belong to?
- Do endangered snakes rely on one type of defense more than any other?
- List the snakes in the data file in order of average length.
- What types of snake markings seem most common? Which seem least common?

When your students are comfortable analyzing the information in the data file to answer questions such as these, have them dream up their own snake searches. Hand out 3″ x 5″ cards, and have each student write down a question about snakes. Select the best questions and have students take turns using the computer data file to answer them.

SNAKE SYNTHESIS, AND MORE!

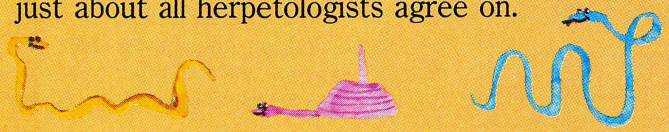
Finally, in following Bloom's taxonomy, you will want your students to synthesize and evaluate the information that they have gathered. Here are some sample wrap-up projects for your students to collaborate on or work on individually:

- Find two snakes in the data file that greatly resemble one another. Draw sketches of the two snakes, and then write a fiction story about the snakes meeting each other on a road one day.
- Create a graph or chart comparing one field of information in the data file with another. For example, graph a snake's length as compared with its weight, or a snake's length with its speed. Write a report explaining what

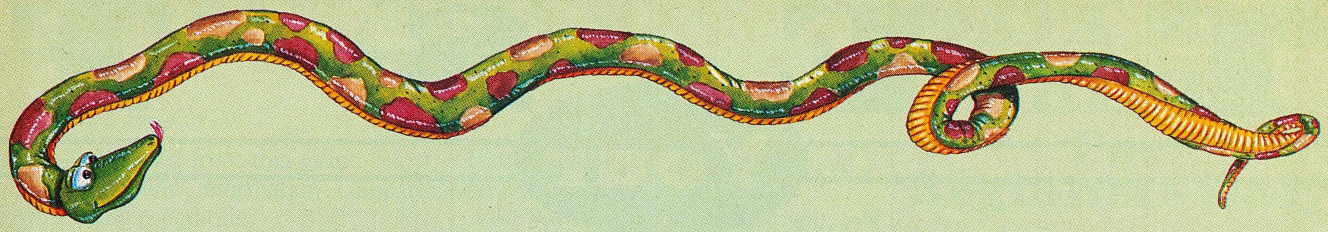
(continued on page 33)

SNAKE FAMILIES

There are some 2,700 species of snakes in the world. To help sort out their similarities and differences, scientists have classified these species into "families." Each family has similarities of its own. At right is a chart of ten snake families and the number of species believed to belong in each one. Although some scientists believe that there are as many as 15 different snake families, these names are ones that just about all herpetologists agree on.



SCIENTIFIC NAMES
Leptotyphlopidae
Typhlopidae
Xenopeltidae
Aniliidae
Boidae
Colubridae
Elapidae
Viperidae
Uropeltidae
Acrochordidae



SNAKES AND BLOOM'S TAXONOMY

Benjamin S. Bloom is well-known in the field of education for his study *Taxonomy of Educational Objectives: Cognitive and Affective Domains* in which he categorized six levels of thinking, each requiring increasingly complex skills. This teaching unit is based on the use of these skills, as described below.

1. Knowledge is recall of definitions, facts, methods of inquiry, and universal concepts. In this teaching unit, students will learn:

- definitions of words associated with snakes, such as *herpetology, diurnal, nocturnal, species,* and *cold-blooded.*
- facts, such as those presented on the "Test Your Snake Sense" worksheet.
- methods of inquiry, such as how to organize a data base, study the information in it, judge, and question that information.
- universal concepts about snakes accepted by herpetologists, such as the concept of snake families.

2. Comprehension is the use of knowledge, without necessarily seeing its fullest implications. In this teaching unit, students will:

- reword or paraphrase information in order to enter it in their data file.
- interpret facts to fit the data file.
- extrapolate from books and other sources those facts that are pertinent to the fields of the data file.

3. Application is the use of information in new situations, both abstract and concrete. In this teaching unit, students will:

- apply their knowledge of snakes toward the creation of a data file.
- apply their knowledge of the data file to decide which fields contain the information needed to solve each problem.
- apply the information in the data file to answer questions and solve problems.

4. Analysis is the breakdown of information into its constituent parts in order to detect relationships between the parts. In this teaching unit, students will:

- analyze the elements in their data file to draw conclusions about all snakes.
- analyze the relationships between information contained in different fields of the data file.
- analyze the various ways in which snakes are classified.

5. Synthesis is putting together elements of information so as to form a new whole. In this teaching unit, examples of creative extension activities for students are given. In each case, students might:

- produce a unique communication, relating the ideas in this teaching unit to prior knowledge and beliefs about snakes.
- draw upon the ideas in this teaching unit to produce a creative project involving snakes.
- propose hypotheses about relations between fields in the data file and then work to prove or disprove them.

6. Evaluation is the making of a judgement based on given or determined criteria. In this teaching unit, students will:

- evaluate theories about snakes, based on the information in the data file.
- evaluate the information in the data file, based on facts learned about snakes.
- evaluate the usefulness of the computer data management program in carrying out a research project about snakes.

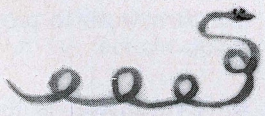
POPULAR NAMES	APPROX. NO. OF SPECIES IN FAMILY
Thread snake or tender blind snake	50
Blind snake	200
Sunbeam snake or iridescent earth snake	1
Pipe snake or false coral snake	10
Boids; boa and python	100
Typical snake or colubrid	2,000
Elapids; sea-snake, cobra, mamba, coral snake	200
Viper, pit viper and rattlesnake	80
Shield-tailed snake	50
Elephant-trunk snake or wart snake	2

NAME: COPY

T E S T Your Snake Sense

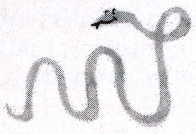
DIRECTIONS: What is "Snake Sense"? It's knowing a lot of true facts about snakes. Test your own snake sense by writing a T next to each true statement and an F next to each false statement. Check your answers with your teacher. Then refer to the chart below. It will show you how your snake sense measures up.

1. ___ There are more than 100 species of snakes in the United States alone.



2. ___ All snakes look the same.

3. ___ Snakes are *cold-blooded* creatures. This means that all snakes feel cold and slimy to the touch.



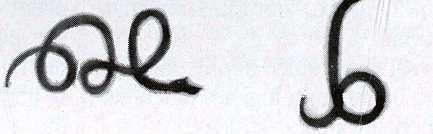
4. ___ All snakes are poisonous.

5. ___ All snakes eat meat.

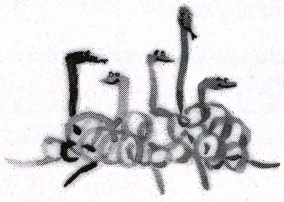
6. ___ Snakes chew their food with their front teeth.

7. ___ You will never find a snake in Iceland or Antarctica.

8. ___ Some snakes are able to make a bad smell, just like skunks do, to scare away their enemies.

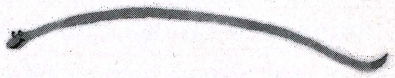


9. ___ All snakes are just about the same size as one another.



10. ___ All snakes prefer to sleep during the day and hunt for food at night.

If you had...



1-3 questions right: Your snake sense is a little shaky, but don't feel bad. Learning about snakes will be fun!
4-7 questions right: Not too bad. Your snake sense could use some strengthening, but you're already on the road to real snake smarts!
8-10 questions right: Where did you pick up all that knowledge?! You must have a real rattler in your blood somewhere!

SnakeSense

(continued from page 30)

can be learned from this graph. How does graphing information compare with using a data file?

- Invent a snake that does not really exist. Define characteristics for it. Then search the data file to see if anything like it *does* exists. Write a story or essay explaining the environment that this snake would need in order to survive. What would it eat? Is it poisonous or not? How does it spend its days and nights? Compare it to some of the other snakes in the data file.
- Write an essay about how this teaching unit has changed the way you look at, and think about, snakes. Be specific.
- Imagine a world without snakes. How might it be different? Would it be better or worse? Why?

At the end of the teaching unit, ask students how they felt about using the computer data management program for this snakes research project (as opposed to preparing reports by hand). Did the data base program make information gathering harder or easier? Were students able to use the information in a larger variety of ways with the data managment program? If they were to do the project over, what might they do differently?

Michael S. Schneider is a New York-based freelance developer of educational materials.

(continued)

SNAKE SENSE WORKSHEET ANSWERS AND ADDITIONAL INFORMATION

1. True. There are at least 2,700 species of snakes in the world, 115 of which are found north of Mexico.

2. False. Although snakes have common characteristics — a forked tongue, scales, a movable lower jaw, and the absence of external ears and eyelids — different species have different sizes, shapes and colors.

3. False. The body temperature of cold-blooded creatures, such as snakes, is usually close to that of the air temperature around them. They are only cold to the touch in a cold environment — where snakes are usually not found.

4. False. Only about 270 species have venom that is harmful or fatal to humans. About 25 of these species cause most deaths from snakebites.

5. True. Snakes that eat only small, harmless animals, eat them alive. Others, which are less finicky, kill the larger and more dangerous of their prey first.

6. False. Snakes swallow their food whole. Because of the way they are built, snakes can open their mouths very wide. They start at one end of their prey and keep swallowing until the animal is gone. A big meal can take a snake an hour or more to eat.

7. True. Snakes cannot survive anywhere the ground is frozen the year round. Thus, you will never find a snake in Iceland or Antartica. In addition, you will never see one in Ireland or New Zealand.

8. True. Snakes have many different defenses. Some use camouflage. Others "run" or make sounds to scare their enemies away. Others play dead, and still others, like the garter snake, create an odor that repulses potential attackers.

9. False. Some snakes, like the anaconda of South America and the reticulate python of Asia, may grow up to 30 feet long. One of the smallest snakes is the Braminy blind snake. It grows to be, on the average, only six inches long.

10. False. Some snakes are *diurnal*, meaning that they like to move about in daylight. Others are called *nocturnal* snakes. They prefer to move about when the sun is down.

DATA BASE PRIMER For Beginners Only

A data base management program is like an electronic filing cabinet or a computerized index-card box. It is a piece of software that lets you organize, store, and retrieve information.

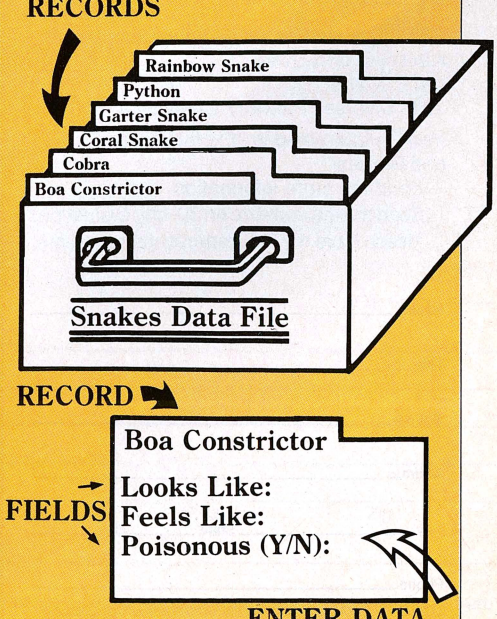
All data management programs contain three important elements: fields, records, and files.

1. Field: A field is a category or item of information. For example, in a data file about snakes, such as the one described in this teaching unit, SPECIES NAME, LOOKS LIKE, FEELS LIKE, POISONOUS (Y/N), and WHAT IT EATS are all fields.

2. Record: A record is a collection or listing of related fields. In this teaching unit, data about each snake is organized into an individual record, so that the species name and description of a boa constrictor would be in one record, while the information about a garter snake might be in another.

3. File: A file is a collection of related records. The boa constrictor record, the garter snake record, and records about any other snakes your students complete during this teaching unit will make up a data file on snakes.

Parts of a Data Base



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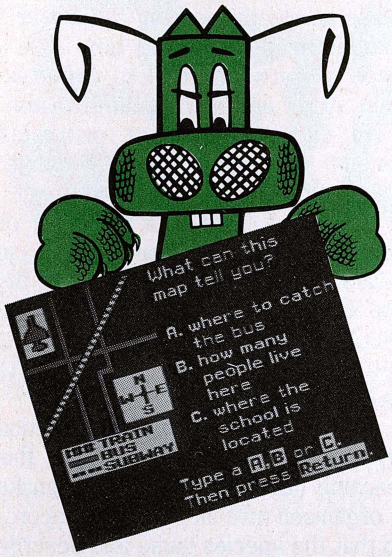

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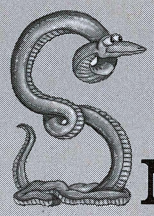
SAMPLE DATA RECORD

SPECIES NAME: Boa constrictor
LOOKS LIKE: Large, stout body, short tail, chocolate brown color shading to deep red at the tail, with sand-colored crossbands. Vestigial hind legs.
FEELS LIKE: Extremely muscular, with fine scales.
POISONOUS (Y/N): N
WHAT IT EATS: Rats, birds, lizards, ducks, and rabbits
WHERE FOUND: Jungles and forests of Mexico, Central America, and parts of South America
DEFENSES AGAINST ENEMIES: Squeezes animals to death, hisses, strikes, bites
SIZE AT MATURITY: 10 feet long
DIURNAL OR NOCTURNAL: Nocturnal
SNAKE'S FAMILY NAME: Boidae
OTHER: Can live for months without food. Sometimes sleeps for a week after a meal. Can give birth to 50 young snakes at one time.



SNAKE BIBLIOGRAPHY

Snakes of the World by Chris Mattison. Facts on File Publications, New York, NY. 1986.
Snakes by Ruth Belov Gross. Scholastic Book Services, New York, NY. 1973.
A Book of Snakes by Dorothy Childs Hogner. Thomas Y. Crowell Co., New York, NY. 1966.
The First Book of Snakes by John Hoke. Franklin Watts, Inc., New York, NY. 1956.
The Snake Book by Roy Pinney. Doubleday, New York, NY. 1981.
Snakes by Nina Leen. Holt, Rinehart and Winston, New York, NY. 1978.
Snakes and Other Reptiles by Mary Elting. A Little Simon Book published by Simon & Schuster, Inc., New York, NY. 1987.
The World of Science: Cold-Blooded Animals by Maurice Burton. Facts on File Publications, New York, NY. 1986. ■

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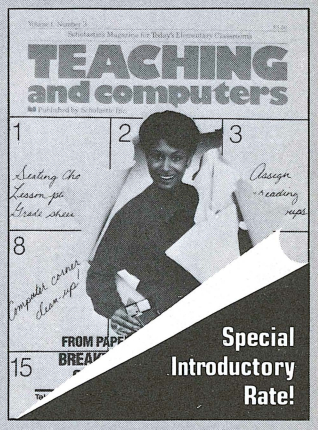

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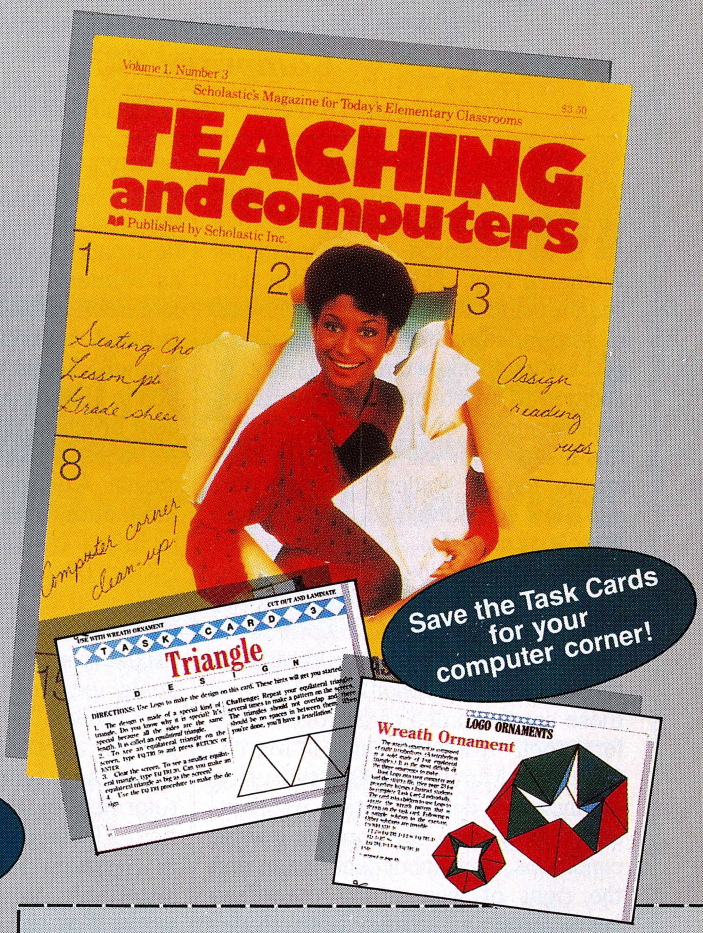

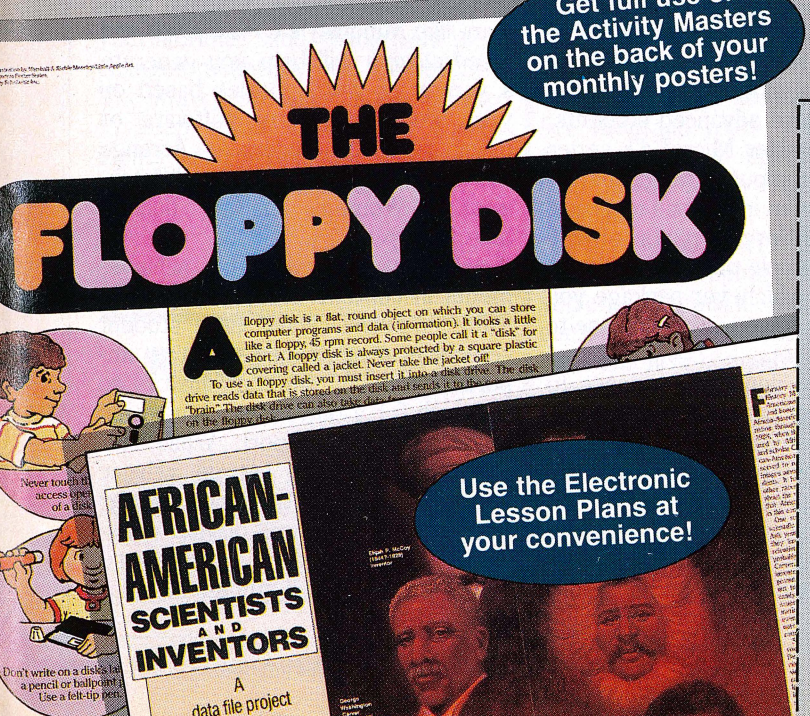

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SOCIAL STUDIES

CELEBRATE WOMEN'S HISTORY

Curriculum Objective:
Enriching understanding of history
Computer Skill:
Working with electronic reference materials

March in America is Women's History Month, while around the world March 8 is celebrated as International Women's Day. This lesson plan outlines a number of ways in which your classroom computer can be used as a tool for exploring women's history. In addition to improving the whole class' understanding of history in general, this lesson plan will help foster pride among female students and encourage their computer use.

Background: The roots of March's celebrations honoring women reach back to March 8, 1857, when women garment workers in New York City marched in protest of terrible working conditions. Many of these same women came together to form their own labor union in March, 1860. On March 8, 1908, the union organized a demonstration by thousands of women for improved work conditions, child labor legislation, and the right of women to vote. Two years later, a German labor leader named Clara Zetkin proposed that March 8 be celebrated as International Women's Day to honor the women workers in the United States. For almost 60 years, March 8 was celebrated in many countries around the world, but not in America. Then, on March 8, 1967, some women's groups in the United States sponsored special celebrations and seminars. By 1970, as a result of a growing women's movement in the United States, women's groups all around the country staged rallies, forums, and media shows to celebrate International Women's Day. In 1977, the Sonoma County (California) Commission on the Status of Women requested that the Sonoma schools designate the week of March 8, 1978 as Women's History Week, in recognition of the economic, social, and cultural contributions of American women. A joint Congressional resolution in 1981 requested that the President proclaim the week a national observance. After five years of similar annual Congressional Resolutions, the month of March was officially established by Congress as Women's History Month.

Materials needed: There are two software programs that provide excellent starting points for your students' explorations of women's history. *Women of Influence* (Wintergreen) offers a quick look at 20 American women political and social reformers of the 19th and 20th centuries. *The Medalists: Women in History* (Hartley) features a total of 34 historically prominent women of the world. For more advanced students, you might consider MicroEd's series of text-only computer programs focusing on women in various historical periods in different parts of the world. Allow ample time to familiarize yourself with whichever package you choose, and to demonstrate its use to your students.

Even if you don't have access to one or more of these software packages, your class can still use the computer as a tool for exploring women's history. Some information on prominent women can be found in encyclopedias and other standard reference works. You might also send away for some of the special publications listed in the Resources box, below. Your class can then create its own data file of prominent women using a data base management program.

In addition to all of the above research materials, you will need a word processing program, computerized puzzlemakers, and a multi-purpose graphics program such as *The Print Shop* (Broderbund).

Discussion: From the information in the Background section above, briefly summarize for your students how Women's History Month and International Women's Day came to be. Explain that these celebrations provide an opportunity to recognize important leaders who may not appear in the usual history books and to appreciate the ways in which women's achievements have benefitted everyone. Ask students to name as many prominent women as they can think of (from history and on the contemporary scene) to include in a classroom Women's Hall of Fame, and jot these names on a chalkboard. By the end of this lesson, tell students, their list will have grown substantially, and they will have a better understanding of women's role in American and world history.

Activity: Have students begin their study of women's history with word games and crossword puzzles incorporating dates, names, and places associated with famous women. Software like Mindplay's *Crozzzwords* and *Wordzzzearch* will help you generate a variety of word puzzles based on your women's history software or other resource materials. Arrange the completed puzzles on a "Patchwork of Women's History" bulletin board.

Activity: Place women's achievements in context with a "Women in Time" timeline. Have each student select one prominent woman or important event in women's history to research for a one or two paragraph word processing report. While students are working, set up a basic world history (or American history) timeline along one wall of your classroom. When student reports are complete, have each student read his

or her report aloud to the class, then attach the report in the proper place on the timeline. (If you have access to *Timeliner* by Tom Snyder Productions, or a similar program, you might utilize it in a modified version of this activity).

Activity: Many key points in American women's history have to do with work, from the protests of women garment workers in the 19th century to the "equal pay for equal work" campaigns of more recent times. Have your students create a graphic history of "Women's Work in America" using *The Print Shop* or a similar program. Divide the class into teams of two, and assign each team to document (in text and graphics) a particular period, turning point, or key figure related to women and work. Compile your students' completed documents as a wall display, a book, or a computer slide show.

Activity: Women's history isn't all about the distant past; most adult women living today have seen tremendous changes in their own lifetime. Your students can compile a women's oral history through interviews with women in your community: teachers, mothers, businesswomen, civic leaders, and so on. Have students use the word processor to make a list of interview subjects and design a simple interview form with such questions as "In what ways have things changed for women in your lifetime?" and "What have these changes meant for you, personally?" The word processor can also be used to keep track of interview assignments and to transcribe and edit responses into "publishable" form.

Carol S. Holzberg
Shutesbury, MA

RESOURCES

Software

The Medalists Series: Women in History (1983). Apple II series (48K), IBM, one drive. Grades 7-8. $39.95. Backup $10. Hartley Courseware, Inc., 133 Bridge St., Box 419, Dimondale, MI 48821, 800/247-1380, in Michigan 517/646-6458.

Women of Influence (1986). Apple IIe/IIc, 80 column, IBM PC and compatibles, one disk drive. Junior high grades and above. $69. Backup $15. Wintergreen Software, 1010 Sherman Ave., P.O. Box 1229, Madison, WI 53701-1229, 608/256-1747.

Women in History Series (1985). Includes *Ancient Greece and Rome* (2 disks); *Medieval/Renaissance Europe* (3 disks); *Africa of the Sub-Sahara, from Ancient Times to the 20th Century* and *20th Century* (2 disks each); *Traditional China* and *Modern China* (2 disks each). Apple IIe (64K); Commodore 64; one disk drive. Grades 9 and up. $79.95 each. MicroED, P.O. Box 24750, Edina, MN 55424, 612/929-2242.

Books

The Faces and Phases of Women ($7) and *The Times and Triumphs of American Women* ($8). Contact the National Women's Hall of Fame, 76 Fall St., P.O. Box 335, Seneca Falls, NY 13148, 315/568-8060.

Assorted

Curriculum guidelines, lesson plan ideas, women's history resources and teacher-training packets. National Women's History Project, P.O. Box 3716, Santa Rosa, CA 95402, 707/526-5974.

MATH

ANCIENT EGYPTIAN COMPUTING

Curriculum Objective:
Analyzing multiplication problems
Computer Skill:
Learning how computers calculate

Most of us think of computers as products solely of our modern age. But there is one aspect of computers which has been around for at least five thousand years: the essence of the mathematical algorithm (step-by-step procedure) by which computers calculate.

This lesson will demonstrate through off-computer activities how ancient Egyptian mathematicians could multiply without a "times table," and how computers today use a comparable algorithm to do complex calculations at nearly the speed of light.

Background: Fifty centuries ago the ancient Egyptians routinely used sophisticated mathematics. They developed geometry ("geo" = earth, "metry" = measure) to redetermine property boundaries after the annual Nile flood; they created a unified system of weights and measures, kept records of trade, grain production, and the population census, were experts at timekeeping and astronomy, and employed detailed calculations in carrying out vast architectural projects like the Great Pyramid of Giza.

Although the ancient Egyptians employed a form of base-ten numeration (see illustration) as we do, they did not have anything akin to our multiplication tables. Yet the Egyptians were able to perform calculations using numbers in the tens of millions. How did they do it? In much the same way modern computers do: with the "binary" (base-2) or "doubling" system, also known as the "two-times table" and built upon the power of two (just as our base-10

system is built upon powers of ten).

Both the Egyptians and designers of computers recognized one simple but profound mathematical fact: that every integer can be uniquely expressed purely as the sum of terms from the binary series: 1, 2, 4, 8, 16, 32, 64, . . . For example, 52 = 32 + 16 + 4. It works for every number you can think of. All that's needed to add up to any number are different terms from this series used only once each.

And notice also how ALL the terms in the binary sequence add together to equal ONE LESS than the next term (1+2+4 = 8-1 = 7; or 1+2+4+8+16+32 = 64-1 = 63).

To complete the following activities, all you and your students need to know, like the ancient Egyptians and modern computers, is how to add two numbers together.

Discussion: Introduce your class to Ancient Egyptian multiplication by modeling these six steps at the chalkboard.

Step 1: Choose any multiplication problem. Arrange the terms side by side (like this: 19 x 23). The left term, tell students, is called the "multiplier" and the right term is called the "multiplicand."

Step 2: Write the "binary sequence" under the multiplier. That is, write the doubling terms 1, 2, 4, 8, 16 . . . down in a column. (Doubling is the same as adding a number to itself.) But stop JUST BEFORE you reach a value which is greater than the multiplier (in this example, stop at 16 because the next term would be 32, which is greater than the multiplier 19).

19	x	23
1		
2		
4		
8		
16		

Step 3: This is where the knowledge that every number can be expressed as the sum of terms from the binary sequence comes in handy. Just circle those terms in the binary column which ADD UP TO the multiplier (e.g., 19 = 16 + 2 + 1. So circle the terms 16, 2, and 1). The Egyptian scribe didn't actually circle the appropriate values but put a mark next to them.

19	x	23
(1)		
(2)		
4		
8		
(16)		

Step 4: Now, write the value of the multiplicand (23) under itself, next to the first term (1) in the binary sequence. Then keep doubling that value (or adding each new value to itself, beginning with the multiplicand) for as many terms as there are in the left-hand column.

19	x	23
(1)		23
(2)		46
4		92
8		184
(16)		368

Step 5: Circle the terms in the right-hand column which are NEXT TO TERMS ALREADY CIRCLED in the left-hand column.

19	x	23
(1)		(23)
(2)		(46)
4		92
8		184
(16)		(368)

Step 6: Now simply add together only the newly-circled terms in the right hand column. And this is the answer to your original problem!

23
46
+ 368
437 = 19 x 23

Now, model for your students the following sequence, which demonstrates in a simplified way how computers calculate. Point out the paral-

EGYPTIAN NUMERATION

	1		10
	2		20
	3		30
	4		40
or	5		50
	6		60
	7		70
	8		80
	9		90

Egyptian "Binary" Column for use in Multiplying

	1
	2
	4
	8
	16
	32
	64
	128
	256
	512
	1,024

100 | 10,000 (bent finger) | 1,000,000 (man in adoring wonder)

1000 | 100,000 (frog) | 10,000,000

Example: = 2,535

ELECTRONIC LESSON PLANS

lels with "Egyptian math."

Step 1: The calculation begins when the values of the problem are input into the computer in our familiar base-10 numerals.

19 x 23

Step 2: Next, this information enters the computer's Central Processing Unit (CPU), specifically the section known as the Arithmetic Logic Unit (ALU) where math and logic are carried out. There, the computer converts the values from base-10 to base-2 numerals: ten digits (0-9) representing a sum of powers of two. To a computer, 19 = 10011 and 23 = 10111. A "1" represents a "yes" to add that place's "power of 2," and a "0" says "no, don't add that power of two in." This step is comparable to the Egyptian Steps 1 & 2 where the multiplier is represented by a sum of circled binary terms.

19 = (10011)	23 = (10111)
$16 = 1 \times 2^4$	$16 = 1 \times 2^4$
$0 = 0 \times 2^3$	$0 = 0 \times 2^3$
$4 = 1 \times 2^2$	$4 = 1 \times 2^2$
$2 = 1 \times 2^1$	$2 = 1 \times 2^1$
$+ \quad 1 = 1 \times 2^0$	$+ \quad 1 = 1 \times 2^0$
19	23

Or, powers of two shown horizontally:

	16	8	4	2	1
	2^4	2^3	2^2	2^1	2^0
19 =	1	0	0	1	1
23 =	1	0	1	1	1

Step 3: At this point, the individual 1's and 0's, known as "bits," must be stored in memory addresses within the computer. Groups of bits are known as "bytes." The locations on the papyrus where the Egyptian inscribed the numerals are comparable to these "memory addresses."

Step 4: To a computer, "multiplication" means "many repeated additions." Thus, the computer adds the number "23" to itself nineteen times. And it does this just two "bits" at a time — but billions of times per second. The computer uses decision-making silicon "logic gates" and electronic binary "flip-flops" in an arrangement called a "half-adder." A

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half-adder simply follows three rules for adding together four possible combinations of two binary bits:

0	0	1	1
+0	+1	+0	+1
0	1	1	10 (sum / carry)

Rule A: If the bits are the same, the sum = 0.

Rule B: If the bits are different, the sum = 1.

Rule C: If both bits = 1, apply Rule A and also carry 1 to the next place value.

By doing this lots of times literally lightning-quick, the computer can "multiply" virtually any quantities together. This step compares with the Egyptian Steps 5 and 6.

Step 5: Again, the values must be stored in the appropriate memory addresses.

Step 6: Now, the base-2 values are converted back into base-10 values (in deference to us humans) in a reversal of Step 2.

Step 7: Finally, the answer is outputted onto a monitor screen or a printer. The scribe simply saw it on his papyrus.

Although their symbolism and their steps are not exactly alike, both the Egyptian scribe and the electronic computer used the binary summation system of mathematics to solve this multiplication problem. You might explain that division (for both the Egyptian scribe and the computer) works the same way but in reversed steps, since multiplication and division are inversions of each other. But since many division problems leave remainders, the Egyptians had to learn to deal with fractions. . . which is a whole 'nother story.

Activity: Have students develop the binary sequence to as many terms as they wish. Do it both in modern and Egyptian numerals. Put it on the bulletin board. Let students practice finding the terms of the binary sequence which add up to any number you give them (for example, 13 = 8 + 4 + 1, or 99 = 64 + 32 + 2 + 1). Then hold a contest for speed and accuracy.

Activity: Assign your students to teams of four, and give each team a set of 10 multiplication problems. Within each team, two students should work together to solve the multiplication problems as the Egyptians did them — first in modern numerals, then using Egyptian numerals. The other two students should work together to solve the problems along the steps that a computer follows.

Extension Activities: Challenge advanced students to attempt division problems as the Egyptians approached them. Start with simple examples.

Have students research different ancient numeration systems (Babylonian, Greek, Hebrew, Roman, Mayan, Chinese, Japanese, Hindu, etc.). In an oral or written report, students should show illustrations of the numerals and also demonstrate how each would have been used to solve the same math problem.

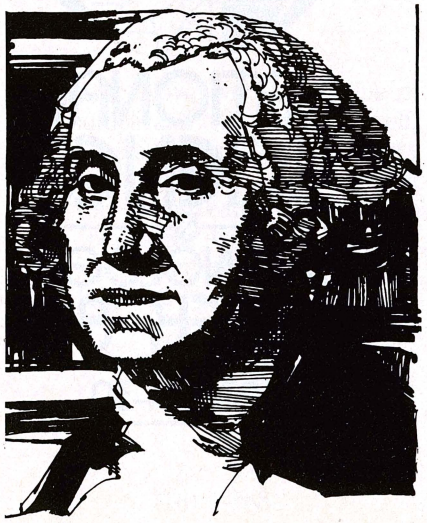
As a Science Fair Project, your class may wish to research and build a simple electric device using switches, relays, and light bulbs to demonstrate the principle of the computer's "half-adder."

Michael S. Schneider
New York, NY

PRESIDENTIAL PROOFREADING

Curriculum Objective:
Identifying and correcting misspelled words
Computer Skill:
Editing with a word processor

Students need practice in finding spelling errors, but often have difficulty seeing these in their own work. In this lesson they'll have an opportunity to "be the teacher," and hone their spelling skills by finding and correcting someone else's errors. They'll also learn about the two American Presidents whose birthdays are celebrated in February.



Preparation: Use your word processor to type the data file material, below, and save it on a blank disk under the file name PREZIDENTS. Students will make changes in the text on the screen and can print their finished product, but will not save their changes so that the text can be used again by other students.

PREZIDENTS DATA FILE

A friend in your class is writing a report on George Washington and Abraham Lincoln. The friend has a little trouble with spelling and asked you if you would help him edit what he has written for spelling errors. Find the 25 spelling errors and correct them. You can use a dictionary

to help you, and you may want to print this section of the report when you have finished.

TWO PREZIDENTS

George Washington was our first prezident, but there is also a well-known story about his childhud. When he was six years old, he receeved a hachet for a prezent. He loved his little hachet, and one day he chopt down a yung cherry tree. His father was furious. When his father asked George about this, George said, "I cannot tell a lie, father. I chopt down the cherry tree."

Abe Lincoln was born in a log kabin in Kentucky as evveryone knows. He had to edicate himself by reeding books such as the *Bible, Aesop's Fables,* and Shakespeare. Then latter he read books of law when he kould get them. Abe was known for his onesty. There are many stories of his dezire to allways be fare. One tells of how when he werked in a country store, he used the rong size weight to waye out a customer's tea. When he realized later that he shuld have given the lady more tea, he wayed out the extra tea and tuk it to her house.

Beth Smith
Fifth Street School
Bangor, ME

RANDOM HOUSE MEDIA

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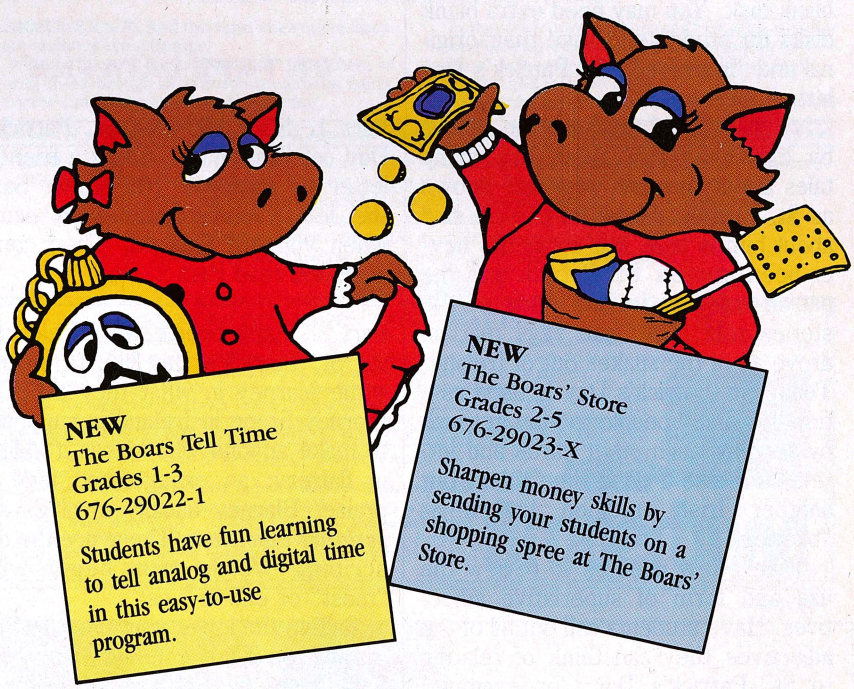

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A BIT O' BLARNEY

Curriculum Objective:
Using the superlative form of adjectives
Computer Skills:
Writing and editing letters on a word processor

In this exercise, students will celebrate St. Patrick's Day by first writing a friendly letter, then "greening" it by inserting superlatives.

Preparation: Type in the ST. PAT'S data file, below, and save it on a blank disk. You may need extra blank disks for students to save their original and "improved" St. Patrick's Day letters.

Discussion: Introduce the lesson by explaining that there are many tales about the man who was known as St. Patrick. Some of what is said about him is true, but some has never been proven. St. Patrick was the patron saint of Ireland. One of the stories told about him says that he drove all of the snakes out of Ireland. Today St. Patrick's Day is used as a time for many people to stay in touch by sending each other cards and letters. It's also a good time to try out another Irish tradition known as "blarney."

Take a few minutes to review the use and form of superlative adjectives. Have students call out all of the adjectives they can think of relating to St. Patrick's Day: for example, *green, lucky,* and *fun.* If this were the best St. Patrick's Day ever, ask students, how would they change these adjectives to describe it? *(Greenest, luckiest, most fun.)* Have students practice creating superlatives out of other adjectives, including those ending in "y," those requiring "most," and irregular examples like *good/best.* Then assign students to call up and work through the ST. PAT'S data file.

When students have completed their second letter, help them make printouts, then have them underline the blarney in their letters. Display the letters on a bulletin board with a large Blarney Stone or shamrock cut from construction or craft paper. A title could be: A Little Blarney from Room .....

ST. PAT'S DATA FILE

Part 1. Start off your St. Patrick's Day celebration by writing a friendly letter to someone you know. Save the letter under your own name when you are finished. Then come back and read Part 2.

Part 2. Many people when celebrating St. Patrick's Day like to include some blarney in what they do. The Blarney Stone in Ireland is supposed to make anyone who kisses it skillful in flattery: an exaggerated kind of praise. Blarney usually involves *superlative adjectives.* These are the describing words that begin with "most" or end in "-est".

Call up the letter you wrote in Part 1, and see if you can add some blarney! If you had written — "I have a new dog who can do some tricks," you might change it to read — "I have a new dog who can do the most tricks of any dog in the whole world!" Add as much blarney as you can, then save this letter under a new file name. Print out both letters and compare them. Have you been kissed with the gift o' blarney?

Beth Smith
Fifth Street School
Bangor, ME

PICK HITS

Challenge your students to create a data base of "instant" book reviews by and for kids. The data record could include these fields: title; author; fiction (F) or nonfiction (NF); kind of book (adventure, mystery, sports, biography); reviewer's name; and finally, a field for a one-word review (funny, boring, exciting, long). Have students fill in a data record each time they finish a book. They can then search the data base whenever they're looking for something special to read (such as a funny mystery). At the end of the year, have them print out lists of all the books the class found exciting, boring, and so on.

PARTY TIME

To reinforce concepts of *who, what, when, where,* and *why,* have students use a program like *The Print Shop* (Broderbund) to make invitations to an imaginary party. Students must decide *who* is giving the party, *what* kind of a party it will be, and *when, where* and *why* it is being given.

--Anne M. Pacheco

CORRECTION

Acknowledgements for the January 1988 "Weather Wise" poster should read:

"First Snow," Reprinted by permission of Harper and Row Publishers, Inc., from *A Pocketful of Poems* by Marie Louise Allen. Text copyright © 1957 by Marie Louise Howarth.

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The following computer-using teachers are very important to *Teaching and Computers*. They are the classroom experts who provide *T&C* editors and artists with feedback and article ideas for every issue.

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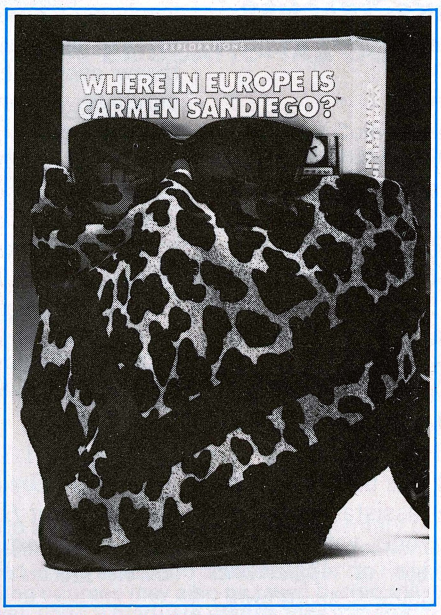

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SOFTWARE SHOWCASE

SOFTWARE RECOMMENDED FOR TEACHERS, BY TEACHERS

SCHOOLWORKS: TEACHER

Computer: Apple II family (requires *AppleWorks*)
Topic: Teacher tool
Grade Level: all

SchoolWorks: Teacher is a group of 34 very useful templates to be used with *AppleWorks* integrated software. It was created to save the teacher the time needed to develop his or her own templates for everything from lesson plan forms to tests, inventory sheets to progress reports. The nicest thing about the program is that you don't have to be an *AppleWorks* whiz to use and profit from it. The first-time *AppleWorks* user will probably need some assistance to get started, but anyone with a basic working knowledge of *AppleWorks* will immediately enjoy *SchoolWorks*.

The program comes with a 28-page booklet that provides a quick overview of the disk and some helpful hints on using *Appleworks'* word processing, data base, and spreadsheet components; the booklet would be even more helpful if there were more illustrations. But the best documentation is contained in the software itself. For each template, *SchoolWorks: Teacher* provides a documentation file conveniently located on the same side of the disk. Directions are clearly written, and can be printed out in hard copy form or kept on the *Appleworks* "desktop" for quick reference.

The templates in this program should meet every teacher's needs (although probably no teacher will use all the templates on the disk). This program will open up many new ways for teachers to make more use of the computer. It would also be a wonderful piece of software for teaching students about computer applications: Students could get a practical introduction to data bases and spreadsheets just by using some of the *SchoolWorks* templates.

Although the program can be used with one disk drive, two disk drives make its use more efficient; with 128K of memory, you can fully realize this software's potential.

One of the great advantages of a computer is the ease it brings to manipulating and storing data. With programs like this, teachers should throw away their filing cabinets and purchase a container to hold data disks instead.

If a school has *AppleWorks* (and many schools do), it should have *SchoolWorks: Teacher*. Also available are *SchoolWorks: Office* and *SchoolWorks: Athletic Director.*

Price: $55 each; two for $99; $125 for all three
Policy: 30-day preview
Source: K–12 MicroMedia, 6 Arrow Rd., Ramsey, NJ 07446; 800/922-0401, 201/391-7555

Mary Drew, Assistant Principal
Summit Hill Jr. High School
Frankfort, IL

(Circle 110 on Product Info Card)

THE PRINT SHOP - COLOR VERSION

Computer: Apple II+, IIe, IIc
Topic: Utility
Grade Level: K–12

The popular graphics program *The Print Shop* is now available with color printing capability. This version allows users to specify different colors for the background, border graphics, and fonts for each printout. Two new features also enable users to preview creations on the screen before printing, and to save them to a disk for future use.

The graphics enhancements are many, including a section called "screen magic" for creating special effects and the ability to print high resolution graphics from another program or "kaleidoscope" *Print Shop* graphics as backgrounds for printouts. You'll even be able to print pictures and text in reverse for use in creating transfers for T-shirts.

The program is completely menu-driven, although reading through the documentation will give both novice and expert user additional ideas for using the software. The only drawbacks are that printing time, even with an Imagewriter II, is very slow because of the need to overprint areas several times in order to create colors; and the cost of printing is much higher because of the expense of the three- and four-color ribbons.

Neither of these drawbacks should dissuade one from using this program, but they should be taken into consideration when thinking about applications.

Price: $49.95
Policy: Backup included; 30-day preview
Contact: Broderbund Software, 17 Paul Dr., San Rafael, CA 94913-2947; 415/492-3500

Beth Lazerick
Computer Education Specialist
Baltimore, MD

(Circle 112 on Product Info Card)

CROZZZWORDS, JUMBLEZZZ, AND WORDZZZEARCH

Computer: Apple II family
Topic: Utility
Grade Level: 3–8

Teachers have long used word puzzles to build reading, spelling, vocabulary, and thinking skills, and as reinforcement for other subject areas. Now three unique interactive utility programs provide a new way to fashion these age-old teacher tools. They make quick work of creating crossword puzzles, scrambled word puzzles, and word searches to suit any curricular area.

The programs are menu-driven, with simple menus accessed by the use of the space bar. Puzzles can be printed out or used at the computer. (I especially like this option: each type of puzzle has some unique help features, and is easy and fun to do on screen.)

For on-computer use, the Challenge Upgrade lets the teacher set a time limit, level difficulty (easy, medium, hard, or "Custom," for teacher-made puzzles), help on/off, answers on/off, and sound on/off. With the Challenge Upgrade the teacher also has the choice of permitting student

access to puzzles already on the program disk, or access only to a data disk of teacher created puzzles. (Mindplay also offers separately five data disks with 90 curriculum based puzzles.)

A performance record for 25 students is kept on the disk, including name of puzzle, time used to solve the puzzle, number of words completed, and percentage of correct answers. Records can be printed out or erased.

The manual for the three programs is clearly written, and fully explains each part of the program. It also suggests additional activities: students can put together Crozzzwords of their favorite books, including title, author, and so on; create a Wordzzzearch of everyone in their family tree; or create a Jumblezzz of words about their town to send in to the local newspaper. There is also a Teacher's Supplement that provides objectives, directions, explanation of the parts of the Challenge Upgrade, suggestions for class use, and answers to puzzles contained on the program disk.

The programs are the kinds of utilities that teachers are becoming used to. It doesn't take long to create a puzzle for printing out and photocopying, although it is cumbersome to make a backup copy of a specific puzzle or edit a finished puzzle. I'd also like to see the letters print out larger.

I used the puzzles as reviews for computer terminology and for a review of the familiar words of the Preamble of the Constitution. My seventh and eighth graders found the puzzles challenging and enjoyed manipulating the words on the screen.

Price: 3-piece puzzle set $79.99; 5-piece data disk set $84.99 (individ. disks $29.99); 8-piece lab pack of puzzles and data disks $139.99.

Policy: 30-day preview

Source: Mindplay, 82 Montvale Ave., Stoneham, MA 02180; 800/221-7911, 617/438-5454

Ann Dana
Computer Consultant, Teacher
District 181, Hinsdale, IL

(Circle 111 on Product Info Card)

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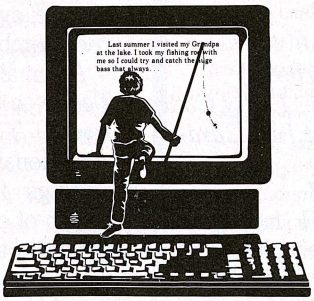

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Circle 31 on Product Info Card.

AWARD MAKER PLUS

Computer: Apple II family
Topic: Utility
Grade Level: K–12

Award Maker Plus is a two-disk package that makes it easy to produce certificates (even in color!) for a variety of occasions. The user selects the desired award by number (listed in the documentation), picks a border, types in the message, *and* has the option of choosing from an impressive array of color schemes for the border — an advantage over similar programs. In addition, the user can create a file of names to print out awards for an entire class, and can load *Print Shop* graphics to use as borders. Each award certificate will print out on an Imagewriter II in four to 10 minutes, depending upon the intricacy of the border and award.

Award Maker Plus is a practical tool. It specializes in the awards that schools most frequently demand, including a wide variety of sports awards and a multitude of academic awards. The documentation is also well thought out, with separate brochures for the program instructions and the Award Style Catalog where design choices are made.

Price: $39.95
Policy: $7.50 backup
Contact: Baudville, 1001 Medical Park Dr. S.E., Grand Rapids, MI 49506; 616/957-3036

Craig Dickinson
Adjunct Instructor
Univ. of Maine, Lesley College

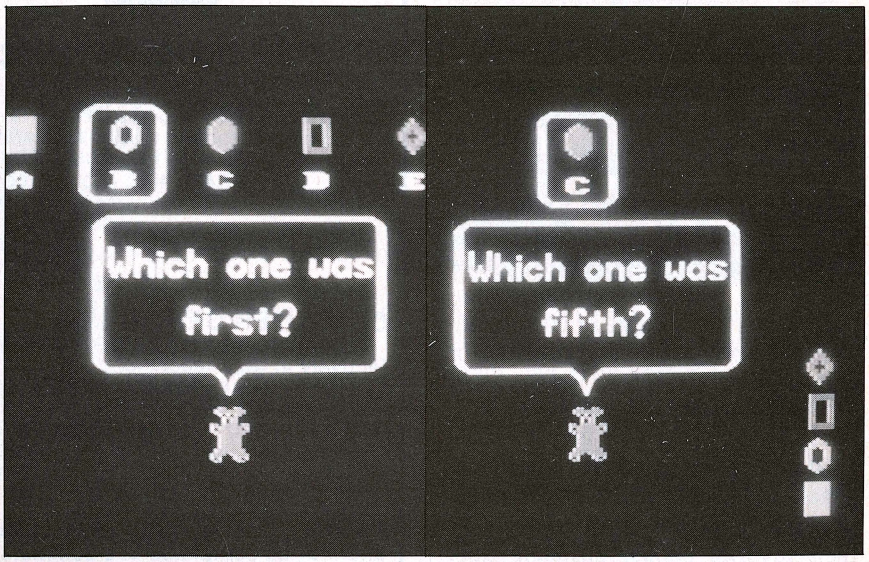
(Circle 113 on Product Info Card)

TEDDY AND IGGY

Computer: Apple II family (also works with Muppet Learning Keys or Touch Window), Commodore 64
Topic: Problem solving
Grade Level: K–2

Teddy and Iggy features a teddy bear and an inchworm in three activities designed to strengthen problem solving skills.

"Teddy's Bed" is a warm-up game. Children must remember the order in which Teddy makes his bed — they are asked to indicate which action came first, which second, and so on. In "Teddy Shapes Up," the teacher or student can choose the level and speed at which Teddy moves when presenting different shapes on the screen, and students are challenged to remember these shapes in sequence. Teddy gives the score and the child can record his or her progress on a record sheet that comes with the documentation. In "Iggy's Boxes," an inchworm opens boxes with letters on them, revealing pictures of items that begin with that letter. Iggy opens the boxes at random; as children identify which was opened first, second, and so on, each picture again appears under its correct number in the sequence.



"Teddy Shapes Up" with memory-building sequences.

As an aid in building memory skills, *Teddy and Iggy* is educationally sound. The games range from instructional to challenging, with useful settings for level and speed. The length of each game is appropriate for the attention span of five- to eight-year-olds. Although beginning reading skills are needed to use this program, the screen designs are so clear and the choice of language so appropriate that my six-year-old tester had no problem digging right in!

The documentation is clear and concise. In addition to the useful score sheets, it provides lots of wonderful extra ideas for teaching.

Because it gives children an opportunity to practice their memory skills without having to be monitored by an adult, this package will fit in well with the regular year-long stress on memory stretching that is done in grades K, 1, and 2. It is well suited for the stated age groups, and maybe even for third graders who need some extra help. And the children who tested *Teddy and Iggy* for me loved it. An excellent package!

Price: $65
Policy: 30-day preview; backup included
Source: Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570, 800/431-1934

Kate Clark
Computer Consultant, Teacher
Sidwell Friends School
Washington, D.C.

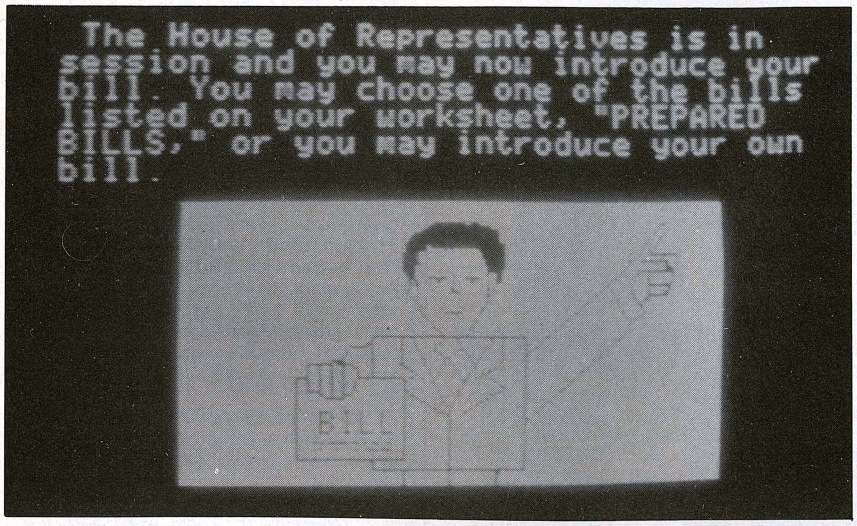
(Circle 114 on Product Info Card)

CONGRESSIONAL BILL SIMULATOR

Computer: Apple II family
Topic: Social studies, government
Grade Level: 7–12

The *Congressional Bill Simulator* gives students a feel for how legislation is actually handled in Congress. The software allows students to shepherd a bill of their choosing as it progresses from Congressional committees, through the House of Representatives and the Senate, to the President.

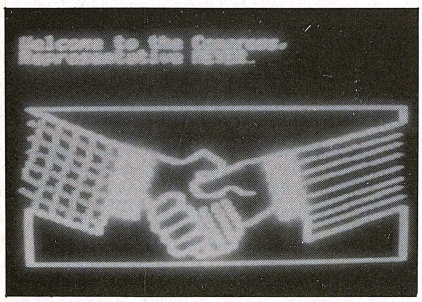
After a brief introduction to the



Will it pass? Bill-handling begins in the House.

program, the student is asked to choose one of 15 prepared bills in the accompanying workbook, or to write one of his or her own. The student must then make a series of decisions that affect how the bill will be handled in the House, from identifying which committee should study the bill, to determining the number of witnesses testifying for the bill and the approach to be taken by lobbyists. The program then tells the student if the bill passed the House; if it did, the a sequence of decisions is presented for moving the bill through the Senate. (If the bill fails to pass in the House, the program ends at that point.) The program ends by telling the student if the President signed the bill or not.

The design of the program is such that students read the screen and make decisions based upon the screen information and their workbook work. The program is logically organized and very easy to follow. The only improvement I would like to see would be more detail on the Senate side of the program.



Each player is "elected" to Congress.

Technically, *Congressional Bill Simulator* works flawlessly and is very easy to operate. Students set their own pace; feedback is very good and is appropriate to the task on hand. Students can change their input easily, and print out data as the program proceeds. However, the program cannot be picked up in the middle, so students must work a problem through, which can take up to two class periods. Student records are maintained for the teacher to examine.

The documentation is relatively clear and concise. There is a good teacher section which includes three lesson plans and pre- and post-tests, and the student workbook also provides very good activities.

In addition to specific instruction about the workings of Congress, the program has general educational value in the area of problem solving. *Congressional Bill Simulator* is extremely motivating and challenging, and students will want to use it over and over again.

Price: $55
Policy: Backup included; 30-day preview
Source: Focus Media, 839 Stewart Ave., Garden City, NY 11530; 800/645-8989, 516/794-8900

Philip Ingber
District Computer Coordinator
Nyack Public Schools
Nyack, NY

(Circle 115 on Product Info Card) ■

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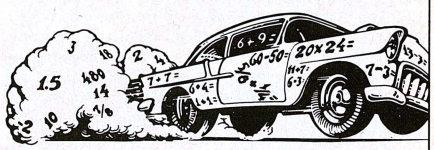

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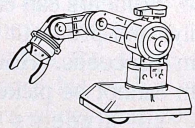

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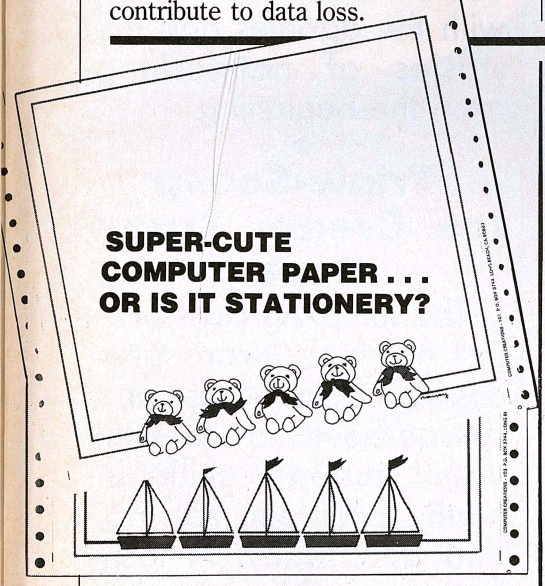

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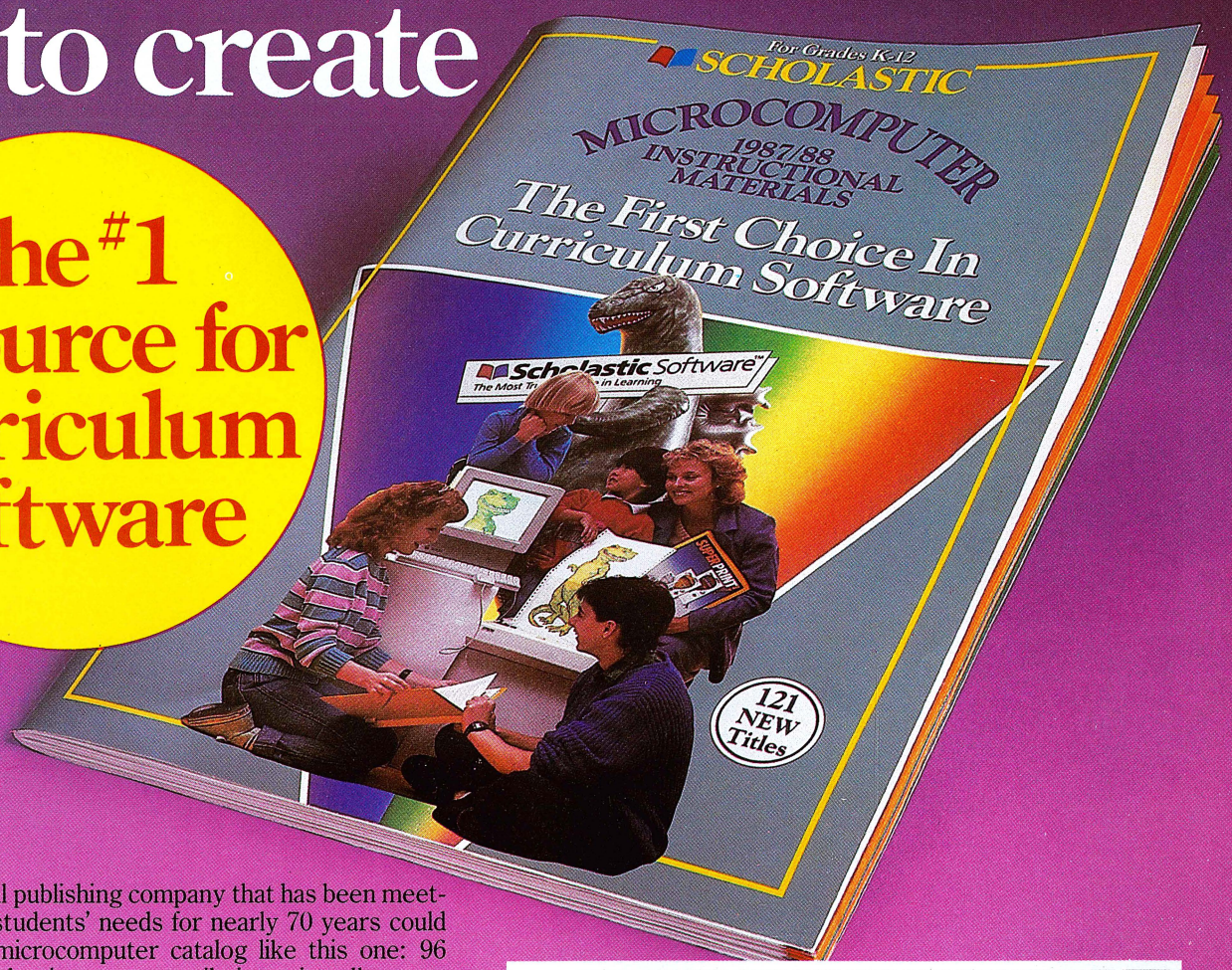

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